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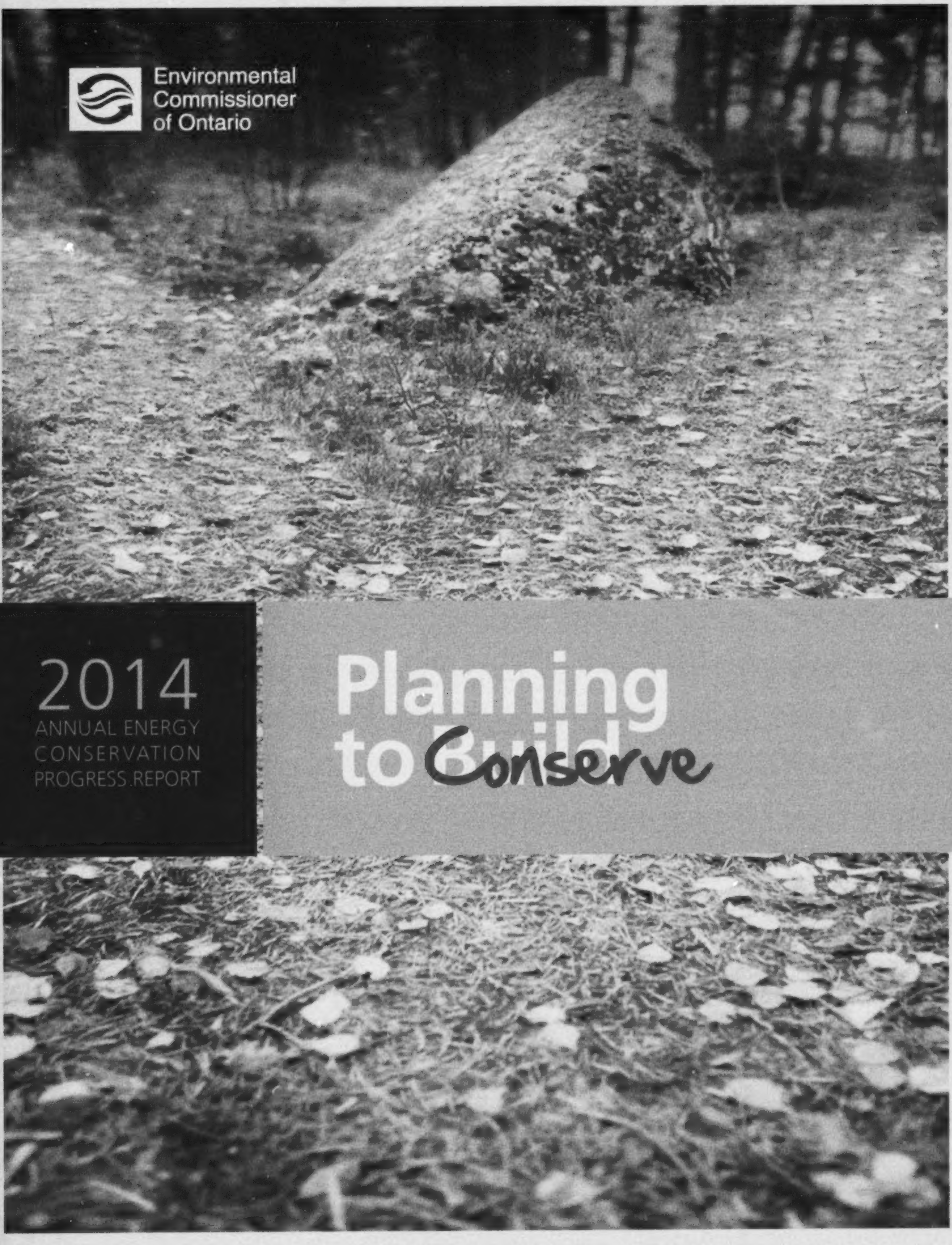
of Ontario



2014
ANNUAL ENERGY CONSERVATION PROGRESS REPORT

Planning to ~~Build~~ Conserve

LIST OF ACRONYMS

CDM	Conservation and Demand Management
DSM	Demand-Side Management
EA	Environmental Assessment
ECO	Environmental Commissioner of Ontario
EV	Electric Vehicle
FIT	Feed-in Tariff
GHG	Greenhouse Gas
GTA	Greater Toronto Area
GWh	Gigawatt-hour (one billion or 10^9 watt-hours)
HOEP	Hourly Ontario Energy Price
ICI	Industrial Conservation Initiative
IESO	Independent Electricity System Operator
IPSP	Integrated Power System Plan
IRRP	Integrated Regional Resource Plan
km	Kilometre
kW	Kilowatt
KWCG	Kitchener-Waterloo-Cambridge-Guelph
kWh	Kilowatt-hour
LDC	Local Distribution Company
LED	Light-Emitting Diode
LTEP	Long-Term Energy Plan
m^3	Cubic Metre
MOECC	Ministry of the Environment and Climate Change
MTO	Ministry of Transportation
MW	Megawatt (one million or 10^6 watts)
MWh	Megawatt-hour (one million or 10^6 watt-hours)
OEB	Ontario Energy Board
OPA	Ontario Power Authority
PJ	Petajoule (one quadrillion or 10^{15} joules)
RIP	Regional Infrastructure Plan
RPP	Regulated Price Plan
TOU	Time-of-Use
TWh	Terawatt-hour (one trillion or 10^{12} watt-hours)
TWh/yr	Terawatt-hour Per Year

Environmental
Commissioner
of Ontario

Commissaire à
l'environnement
de l'Ontario

Gord Miller, B.Sc., M.Sc.
Commissioner

Gord Miller, B.Sc., M.Sc.
Commissaire

January 2015

The Honourable Dave Levac
Speaker of the Legislative Assembly of Ontario

Room 180, Legislative Building
Legislative Assembly
Province of Ontario
Queen's Park

Dear Speaker:

In accordance with section 58.1 of the *Environmental Bill of Rights, 1993,* I am pleased to present to you the Annual Energy Conservation Progress Report – 2014 of the Environmental Commissioner of Ontario for your submission to the Legislative Assembly of Ontario.

The Annual Energy Conservation Progress Report – 2014 is my independent review of the Ontario government's progress in conserving energy.

Sincerely,

Gord Miller
Environmental Commissioner of Ontario

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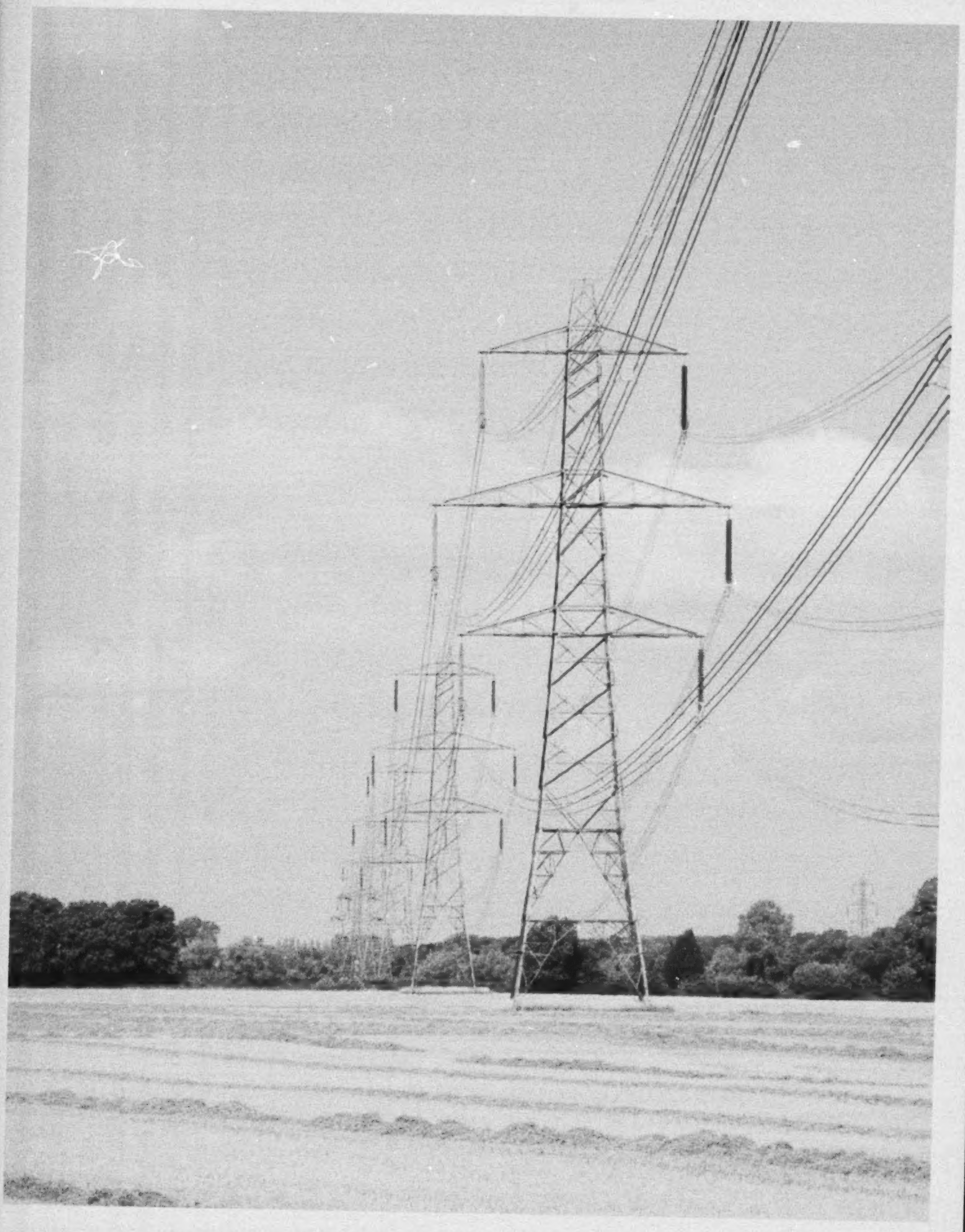

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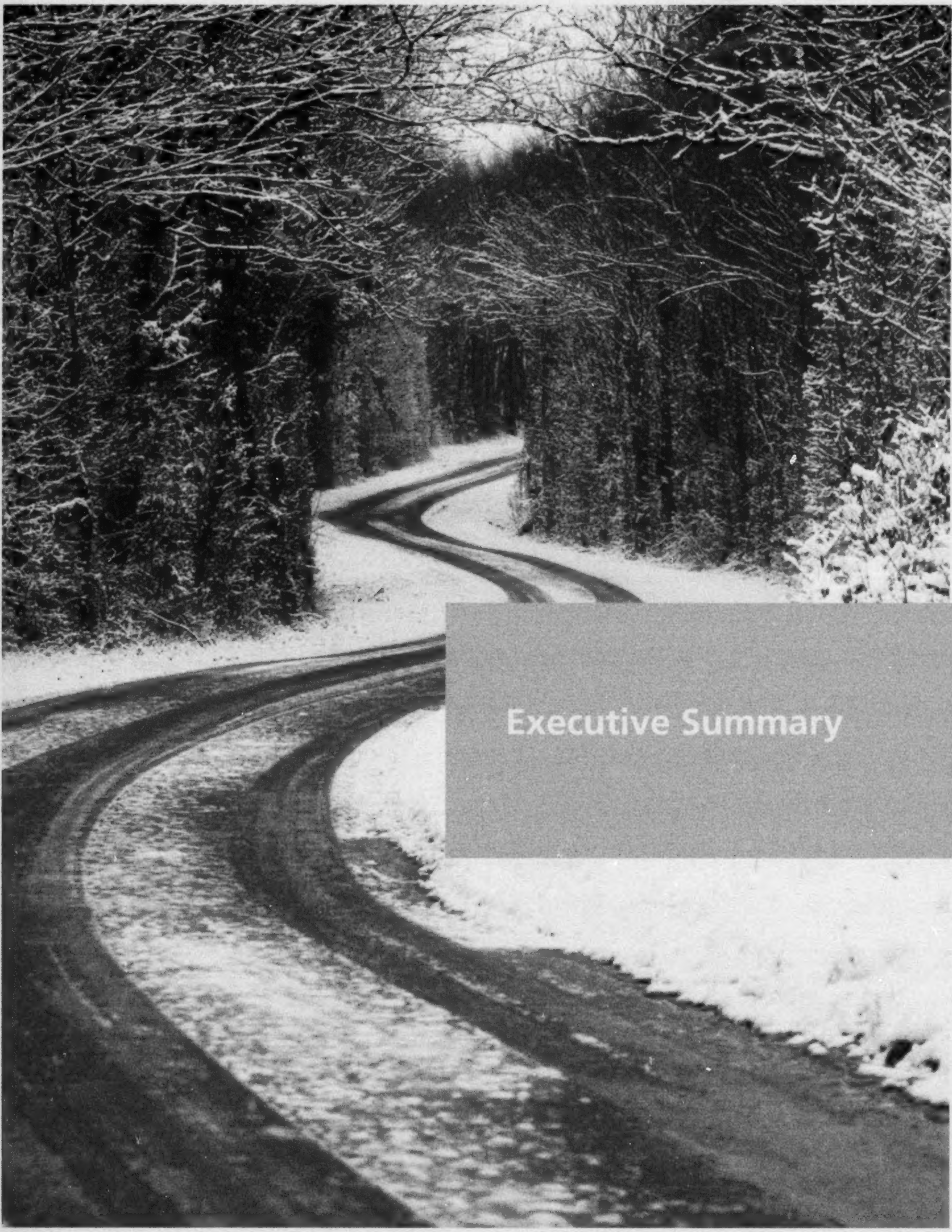

Executive Summary

Executive Summary

The ECO's Annual Energy Conservation Progress Report is a valuable resource to monitor the pace and scope of efforts to conserve energy in the province. Each year, the report provides an independent review of the effectiveness of Ontario's energy conservation policies, regulations and programs implemented by government ministries, agencies and boards. This 2014 report begins by covering policy developments in 2013 and 2014 that focussed on the integration of conservation in energy planning. It then provides an analysis of energy conservation program results for 2013.

Policy Developments

Conservation First

Central to recent electricity policy developments was the government's vision of *Conservation First*, originally expressed in a discussion paper and posted on the Environmental Registry as a policy proposal (#011-9614). The vision is guided by the principle that conservation should be the first resource considered in meeting power needs.

The Ministry of Energy took several key actions to embed this vision in Ontario's electricity system planning including:

- Releasing the 2013 Long-Term Energy Plan (LTEP), which established the role of conservation in provincial electricity system planning and made commitments to implement some of the *Conservation First* discussion paper's proposals;
- Directing the Ontario Power Authority (OPA)* to implement elements of the LTEP such as the transition of demand response programs to the Independent Electricity System Operator (IESO);
- Directing the OPA and Ontario Energy Board (OEB) to establish a new policy framework for the delivery of electricity conservation programs by local distribution companies (LDCs) between 2015 and 2020 (the Conservation First Framework);
- Directing the OEB to establish a new conservation framework for natural gas distributors covering the 2015-2020 period, and to review the integration of conservation into electricity and natural gas infrastructure planning at the regional and local levels.

The status of many other policies and initiatives contained in the *Conservation First* discussion paper, such as: dynamic pricing, building efficiency ratings, program financing mechanisms, and public sector conservation plans, is still under consideration.

The ECO commends the Ministry of Energy for using the Environmental Registry to consult the public on such an environmentally significant proposal.

Achievable Conservation Potential

To identify how much electricity Ontario could conserve over the next two decades, the OPA commissioned an Achievable Potential study. The study's results were used by the Ministry of Energy to reset Ontario's electricity conservation targets. It was also used to estimate the program investments needed to acquire conservation savings and program cost-effectiveness compared to generation investments.

The study found that low-cost conservation can play a significant role in meeting Ontario's future electricity needs. While the study enhanced transparency of target development, many of its elements are still obscure because they rely on undisclosed assumptions of the OPA's forecasting model. Despite this incomplete understanding of the methodology, the study arguably adopted a conservative approach to calculating conservation potential (e.g., did not provide a true estimate of technical potential). Nevertheless, the selected conservation targets are aggressive when compared against actual conservation performance from 2005 to

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* As a result of a government decision in 2014, the OPA and the IESO were merged into one agency, effective January 1, 2015, named the Independent Electricity System Operator (IESO), which will assume the functions of the two agencies.

2013. The ECO is encouraged by the government's commitment to provide an updated achievable potential study every three years.

2013 Long-Term Energy Plan

Putting conservation first is the guiding principle of the 2013 LTEP. In 2013, the government conducted a review of the LTEP and sought public comment on options for investment plans for Ontario's power system to 2032.

According to the 2013 LTEP, Ontario's electricity demand will remain flat in the near term because of conservation, structural economic change, and reductions in energy intensity. Conservation is expected to offset approximately 70 per cent of demand growth between 2012 and 2032. The plan also set a new long-term energy conservation target – 30 terawatt hours (TWh) in 2032. It replaces all previous energy reduction targets in the 2010 LTEP. Unlike the 2010 LTEP, the 2013 plan contains no interim targets, and there is no official peak demand reduction target. Lowering peak will be achieved indirectly through peak savings from initiatives that are primarily focused on reducing overall electricity consumption, including more stringent codes and standards and efficiency programs, as well as targeted Demand Response resources which the government projects will meet 10 per cent of the peak demand forecast in 2025.

The Minister of Energy does not appear likely to issue a supply mix directive providing legal authority for the 2013 plan's conservation targets as was done for the 2010 LTEP. Similarly, it would appear that the statutory requirement to prepare an IPSP has been abandoned and replaced with an approach largely under purview of the Minister of Energy. The ECO believes government should either obey the existing law or amend the *Electricity Act, 1998* to establish a legal framework that would better meet the Act's objectives.

The ECO believes the loss of all previous LTEP targets represents a loss of government accountability. The 2013 Plan is less prescriptive, with a single conservation target set 17 years in the future. On the one hand, this may support a nimble planning process that corrects for changing conditions and helps avoid overbuilding new supply. But on the other, the previous targets were all abandoned before the target years were reached, making a progress report on the government's achievements impossible. Because the Ministry of Energy did not provide the rationale or an analysis of the impact of these target changes, neither the ECO nor the government, can advise whether Ontarians will fare better or worse had the old targets been retained.

> The ECO recommends that each update of the Long-Term Energy Plan explain the rationale for all target changes, including the consequences of altering, missing, exceeding or abandoning previous targets.

In the absence of interim targets, the ECO is encouraged by the LTEP's commitment to regularly publish an Ontario Energy Report. To remain accountable to its long-term conservation commitments and avoid the 2032 target serving only an aspirational function, the ECO believes more accountability should be built into the LTEP's reporting mechanisms.

Energy efficiency from appliance standards and the Ontario Building Code will be relied on to provide one-third of 2032 conservation savings. The ECO repeats its past caution of accepting the OPA's codes and standards savings at face value because it is not known how these savings are calculated. To ensure accountability, such information should be provided in the Ontario Energy Report.

The ECO recommends that the Independent Electricity System Operator expand its scope of evaluation to measure and report energy savings from codes and standards.

The 2015 – 2020 Framework for Electricity Conservation Programs

The Ministry of Energy established a short-term electricity conservation target for 2020 that is derived only from LDC conservation program savings. The government directed the OPA and OEB to establish a new framework for electricity conservation and demand management (CDM) programs between 2015 and 2020. Under this framework, electricity distributors must make CDM programs available to all customers to reduce consumption by 7 terawatt-hours (TWh). This target will require LDCs to conserve an average annual incremental savings of 1.2 TWh of electricity in each of the 6 years, which is more than double what was achieved under the previous 2011-2014 CDM Framework.

The 2015-2020 framework incorporates several lessons learned from the 2011-2014 framework. LDCs will assume a more prominent role and will create CDM plans comprised of province-wide programs jointly designed by the OPA and distributors, and custom programs solely designed by an LDC and approved by the OPA. The OEB's role in the facilitation of LDC conservation program delivery is substantially reduced by the 2015-2020 framework; the Board will no longer be responsible for custom program approval but will publish LDC annual program results. The OPA will complete a mid-term review of the framework in 2017.

Conservation programs offered under the framework must be cost-effective (with certain exceptions). Calculation of conservation program cost-effectiveness must include a 15 per cent adder to account for the environmental, economic and social (i.e., non-energy) benefits of conservation. The adder should enable more potential CDM programs to meet the framework's cost-effectiveness requirements. The Ministry's decision to account for non-energy benefits in the calculation of cost-effectiveness is laudable and in line with best practices in other jurisdictions. The OEB rejected the need for an adder to incorporate the environmental impact of reduced natural gas consumption in 2011. The ECO encourages the Board to include such a policy for natural gas conservation.

The ECO questions whether LDCs have enough incentive to aggressively pursue their targets due to the largely 'all or nothing' incentive system offered by the framework. LDCs will be able to recover their costs for delivering conservation programs via two incentive mechanisms. A pay for performance mechanism will also be available to LDCs in annual payments or as a lump sum payment, based on an as-yet undetermined dollar amount per kilowatt-hour of verified savings achieved. It is expected far fewer LDCs will opt for this incentive mechanism.

The 2015-2020 Framework will encourage utilities to collaborate through enhanced financial incentives and faster review of CDM Plans, but offers little likelihood of financial penalty for LDC underperformance. If program savings are less than half of an LDC's annual milestone target, the OPA can attempt to improve performance, although only through administrative penalties.

Overall, the ECO supports the approach of the 2015-2020 Framework with LDCs as the 'face of conservation,' tasked with meeting an aggressive target and without their focus divided by different energy and peak demand targets. The ECO cautions that target achievement relies on two key assumptions: that the theoretical conservation potential identified in the achievable potential study can be translated into practical program achievements; and, that the cost to deliver a unit of conservation will remain unchanged as the amount of conservation increases. These risks are mitigated by the requirement that the OPA perform another achievable potential study within the next two years using a different methodology, and the Minister of Energy's direction to assess the conservation budget during the framework's mid-term review.

Regional Electricity Planning

Some Ontarians and local governments have been deeply dissatisfied with provincial decisions to locate infrastructure in their communities. The streamlining of environmental and other approvals created a perception that development could not be effectively opposed. Within this context, planning at the regional level came under review in 2013. The OEB introduced a formal framework for regional electricity planning that codified many of the practices that had been followed informally, and aligned the Board's planning approval process with one developed by the IESO and OPA at the request of the Minister of Energy. The OPA and IESO jointly consulted Ontarians on how to better engage local communities in planning and siting electricity infrastructure in a manner that respected communities' views. The OPA and IESO made 18 recommendations on how to improve planning ranging from changes to the *Planning Act* and *Environmental Assessment Act* to mechanisms to strengthen community feedback loops to building energy needs into municipal Official Plans.

The OPA and IESO also provided process improvement suggestions like developing community energy plans and creating mandatory siting guidelines. The agencies also urged that planning recognize broader societal goals by factoring in social and environmental benefits to expand planning beyond a least-cost approach focused narrowly on electricity needs. The OPA and IESO consulted ministries, agencies, associations and others on several implementation issues and, in the case of environmental issues, advised that further work was needed to address such issues earlier in the procurement process.

Ontario's new and still developing regional electricity planning process consists of two inter-related routes of approval: a Regional Infrastructure Plan (RIP) or an alternative Integrated Regional Resource Plan (IRRP). A needs screening is performed to determine whether to undertake regional planning. If the nature of the need is determined to be regional, the next step is to scope whether an RIP or the OPA's broader IRRP is the suitable solution. If a wires-only solution is appropriate, an RIP proceeds and specific wires options are examined. The OEB then uses the RIP in a leave-to-construct or a rate application. If scoping determines that the IRRP is more fitting, the OPA initiates an IRRP process to compare the broader resource solutions, including conservation, generation and transmission. The IRRP options are examined through public consultation on the scoping report and further consultation later in the process through community participation in development of the IRRP. During the next five years, the OPA has promised an assessment of the need for regional plans in all 21 electricity regions. Nine such plans are already underway.

The ECO analyzed the extent to which the process puts conservation first in regional plans, and whether a revamped environmental approvals process could assist the goal of strengthening local engagement and input. To prioritize conservation first, the ECO concluded the linkage of regional plans to the provincial electricity plan should be clarified to determine which of these plans takes precedence. To improve accountability, the government should provide a legally binding provincial-level energy plan describing the roles played by the plan and the Minister's directive power in the IRRP process.

The ECO suggests the government take the following steps to operationalize conservation first: issue a supply mix directive or legislative amendment to create a legally binding "loading order" for the sequence of planning options (e.g., energy efficiency as the first preferred option); issue direction to the OPA on how to implement conservation first in the IRRP's Scoping Assessment Outcome Report; issue a set of protocols to guide agencies when local advisory committee preferences conflict with other planning options.

The ECO acknowledges creation of mechanisms to incorporate conservation in regional plans through distributor-level CDM plans, and this is cause for cautious optimism. The ECO believes that providing strong incentives to LDCs to pursue conservation for specific regional planning reasons would result in more conservation in regional plans.

The IRRP process lacks accountability because there are no legal (i.e., statutory) requirements on the type and level of consultation required, unlike those contained in the Integrated Power System Plan, the *Environmental Assessment Act* or the *Ontario Energy Board Act, 1998*. In effect, the OPA itself can decide the appropriate level of consultation.

The ECO suggests that the government has created yet another process when existing environmental assessments serve the same purpose of providing transparent planning that considers the rationale (i.e., need) for infrastructure while enabling public input. The ECO believes that the government should revisit the role of the *Environmental Assessment Act*. As the OPA and IESO noted, if full Individual EAs were required for all large generation stations (as the Act originally intended), proponents would have to consider the need for a project and alternative solutions, as well as mitigation measures resulting in extensive public consultation on site selection and approvals.

Conservation of Natural Gas – a New Pipeline for the Greater Toronto Area

Policy development for a new regulatory framework for natural gas conservation was initiated by the OEB in early 2014 and continued through the year. The Board also gave approval to Enbridge Gas to construct a natural gas pipeline to increase gas supply to the Greater Toronto Area (GTA), with some parties critical of the cursory consideration given to conservation alternatives.

Enbridge Gas Distribution Inc. and Union Gas Limited will jointly invest more than one billion dollars in new natural gas pipeline to serve a growing GTA customer base, as approved at an OEB hearing where opponents argued that some components of the GTA pipeline were avoidable with an increased emphasis on targeted natural gas conservation. This led the Board to re-examine the role that conservation should play as an alternative to hard infrastructure (pipe).

The gas distribution network is built to meet customers' maximum (peak) demand, which typically occurs on the coldest winter days. The peak day demand for the area served by the GTA pipeline has grown and is forecast to continue growing, although the total amount of natural gas used annually by Enbridge customers within the GTA project area has remained flat over the past ten years.

Several environmental groups raised technical objections to Enbridge's forecast of future peak demand, arguing the methodology was approximate, unclear and improperly accounted for increasing efficiency of buildings. They also noted that a different trend analysis of peak demand was possible from use of historical data. More fundamentally, they believed Enbridge's proposal was essentially incompatible with the Ontario government's policy goal to deeply cut greenhouse gas emissions, and proposed strengthening conservation efforts to avoid the projected increase in peak demand.

Enbridge rather summarily dismissed demand-side management (DSM) as an alternative, stating that conservation programs designed to reduce gas consumption do not necessarily reduce peak demand.

The Board was somewhat sympathetic to the argument for conservation as an alternative, but noted uncertainty over the ability to quickly scale up conservation programs to offset the need for the pipeline and the cost of such programs. It also noted Enbridge's inability to calculate and quantify peak demand savings from conservation. This led the Board to conclude that the supply-side approach of proceeding with the GTA pipeline was preferable but warned that it expects a more rigorous examination of demand-side alternatives, including rate options, in future gas facilities applications. The Board also indicated that, at some point in the future, it would examine integrated resource planning for gas utilities, i.e., a comparison of demand- and supply-side solutions to infrastructure needs. Unlike the electricity sector, true integrated resource planning is not followed by Ontario's natural gas utilities today. (The OEB first examined integrated resource planning for gas utilities 20 years ago but never followed through to require it. Consequently, nowadays utilities evaluate whether system supply expansions are in the economic interest of customers, comparing the financial impact of a project with doing nothing. They do not perform an economic comparison with options like conservation).

The OEB's approval of Enbridge's GTA pipeline reflects this lack of a legal requirement for integrated resource planning in the gas sector. In March 2014, the Minister of Energy directed the OEB to develop a new policy framework ("the DSM framework") to guide Enbridge and Union Gas on conservation programs they will offer from 2015 to 2020. The directive includes a specific instruction requiring the Board to take appropriate action in order to implement the government's policy of putting conservation first in gas distributor infrastructure planning, where cost-effective and supportive of reliability. The new DSM framework had not been finalized as of December 2014, although some principles of the draft framework support these sentiments. Also the draft DSM framework proposes that Enbridge and Union Gas each conduct a study on the role of DSM in serving future system planning, and that all future leave-to-construct applications must include evidence of how DSM has been considered.

The ECO is not necessarily convinced that the GTA pipeline could have been avoided but is persuaded by arguments that conservation was never given a fair chance as an alternative. Proof of increasing peak gas demand in the GTA was weak and Enbridge's methodology to forecast future peak demand was quite crude. The ECO believes that the Minister's directive to the OEB and the OEB's new draft DSM framework guidelines for natural gas conservation programs are much-needed steps in the right direction. It is unfortunate that these steps have been taken only after the approval of the GTA pipeline, as it is unlikely that Enbridge or Union Gas will undertake additional infrastructure projects of this size in the near future.

The ECO makes five suggestions and two recommendations to encourage consideration of DSM: early advance public identification of infrastructure projects (which allows fair consideration of conservation as an alternative); utility demand forecasting guidelines; a review of equitableness of supply and demand-side incentives; a need for utilities to assess how their program offerings reduce peak demand; and, protection of budgets for traditional utility conservation programs that focus on overall reduction of natural gas use.

The ECO recommends that the Ontario Energy Board require natural gas utilities to file advance notice of any identified distribution system need that could have significant cost impact, and ensure conservation is considered as the first resource to meet some or all of this need.

The ECO recommends that the Ontario Energy Board allow utilities to increase their conservation budget if targeted conservation spending would avoid greater future infrastructure costs.

Time-of-Use Rates and the Industrial Conservation Initiative

Time-of-use (TOU) rates and the Industrial Conservation Initiative (ICI) are two electricity pricing policies in Ontario that encourage people to change when and how they use energy. This report reviews the first available data from both programs.

Virtually all small volume consumers, like households and small businesses, pay TOU rates. The price differential between different price periods can encourage customers to shift electricity use from more expensive times (on-peak) to less expensive times (off-peak). Both the OPA and OEB conducted independent analyses of TOU rates in Ontario, and the first results were released in 2013. These studies found a small, but observable, drop in on-peak residential electricity demand during the summer months. However, the ECO believes that Ontario could see more savings if it increases its price ratio. The OPA's report showed how consumers respond to different TOU rates based on the results of 42 international studies. The studies demonstrated a positive relationship between the on-peak to off-peak price ratio and the amount of peak demand savings that result.

Given that the OEB will commence a comprehensive review of the Regulated Price Plan in fiscal year 2014, which governs small volume consumers and TOU rates, the ECO believes that now is an ideal time to examine how Ontario can use its TOU policy to maximize energy conservation. This would likely require the Board to widen the on-peak to off-peak price ratio; either pro-actively or under direction from the Ministry of Energy, reflecting Ontario's "conservation first" electricity policy.

The ECO recommends that the Ontario Energy Board significantly widen the peak to off-peak price differential.

Large-volume customers, such as universities and manufacturers, pay the real-time market price for electricity. This market price reflects the cost of electricity generation at a given point in time. Another component of electricity bills is something called the Global Adjustment, which accounts for the differences between the market price and the rates paid to contracted generators and regulated generators (as well as payments for conservation programs). Until recently, the Global Adjustment was applied as a flat rate for all consumers based on the volume of electricity used. This policy changed for very large customers when the ICI launched in January 2011. The ICI offers participating customers the opportunity for large bill savings, through lower Global Adjustment payments, if they reduce their electricity use at times when Ontario-wide electricity demand is very high.

The first results for energy conservation under ICI are now available. The program appears to have saved 575 MW in 2011, 875 MW in 2012, and 850 MW in 2013, which is about the capacity of a large new natural gas power plant. There are some 200 ICI participants, which represent approximately 9.6 per cent of Ontario's peak demand, and 17 per cent of Ontario's total electricity consumption. There is momentum behind the ICI program. The 2014 Budget announced the threshold for certain types of industrial consumers to participate would be lowered from 5 megawatts (MW) to 3 MW average monthly peak demand, thus capturing more consumers for the ICI program.

As the Global Adjustment has become a larger portion of the price of electricity, the ICI incentive for participating customers has grown, as has the resultant impact on the electricity bills of those customers who do not participate (or cannot participate because of program rules). In 2013, ICI transferred approximately $500 million in costs from participants to non-participants, raising the bills for customers outside of the program by roughly 0.4 cents/kWh.

The ECO notes that Ontario has the ability to measure consumption for all electricity customers on an hourly basis. This provides an opportunity to look holistically at pricing strategies for all classes of Ontario electricity customers, including Regulated Price Plan customers, ICI participants and the "in-between" group that uses too little electricity to be eligible for ICI.

Pricing policy for one group of customers directly or indirectly impacts the pricing policy for other groups. The ECO believes that the OEB should consider the inter-relationships in pricing between different customer classes as part of its review of the Regulated Price Plan in order to avoid policy inconsistency, as well as attempting to achieve fairness across customer classes, manage system costs through conservation, and reduce environmental impacts.

The ECO recommends that the Ministry of Energy lead an integrated review of the electricity pricing structure for fairness and conservation.

Energy Conservation Targets

Natural Gas Utility Conservation Targets

In 2013, Ontario's two large natural gas distributors, Enbridge Gas Distribution and Union Gas, continued to offer conservation programs to their customers as part of the utilities 2012-2014 DSM plans which set out programs offered, allowable budgets and performance targets and incentives. As 2013 is the middle year covered by these plans, the utilities made minor program refinements. An updated set of guidelines for conservation programs for the 2015-2020 period is currently under development.

Conservation targets are established for each of the three categories of conservation programs that the utilities deliver. The most important targets are the lifetime natural gas savings achieved from distributors' resource acquisition programs. Gas savings from Enbridge's 2013 programs were lower than in 2012 for all sectors except residential, and also much lower than Enbridge's 2013 targets. Union Gas was more successful and increased overall gas savings in 2013, with a large increase in savings from its programs for large-volume industrial customers, a more modest increase in savings from programs for commercial and residential customers, and a very slight decrease in savings from programs for low-income customers.

Each utility is eligible for performance incentives scaled to their performance against targets. Based on the 2013 results, the utilities will be eligible for $12.3 million in incentives ($4.5 million for Enbridge Gas Distribution and $7.8 million for Union Gas). This is a disappointing result for Enbridge, which was eligible for $8.8 million in incentives in the previous year.

The mix of programs offered by Enbridge and Union continues to be refined each year. A few trends of interest with the 2013 programs were: strong growth in residential home retrofit programs; attempts by Enbridge to encourage and accurately measure energy savings from low-cost building operational practices; and a new approach by Union whereby large industrial customers are given priority access to a dedicated account to fund investments in energy efficiency projects.

Enbridge and Union spent approximately $60 million on gas conservation programs in 2013 ($27.8 million by Enbridge, and $32.8 million by Union Gas). The utilities typically spend their entire conservation budgets each year, but in 2013, Enbridge underspent its budget by almost $4 million -- a surprising result. It is uncertain whether more marketing, a different program mix, or higher incentive levels could have enabled more customers to participate in Enbridge's conservation programs.

The conservation initiatives funded by Enbridge and Union continued to offer good value for society. Each dollar spent on energy efficiency (by customers and utilities combined) yielded approximately $2.43 in savings (largely through savings on gas costs) for Enbridge's resource acquisition programs, and $1.53 for Enbridge's low-income programs, as measured using the Total Resource Cost test. Union's programs were even more cost-effective with an average gas savings of $3.83 per dollar spent on efficiency programs.

LDC Electricity Conservation Targets, Year Three

The 2011-2014 electricity conservation framework assigned a cumulative energy savings target and a peak demand reduction target to each LDC. In aggregate, the targets are 6,000 GWh of energy savings between 2011 and 2014, and 1,330 MW of peak demand reduction in 2014. Results for 2013 show a slight increase in program activity levels and overall energy savings, with some programs improving and others on the decline.

Many new residential customers signed up for the *peaksaver* PLUS initiative, which reduces strain on the electricity system at times of peak demand. The Home Assistance Program, which upgrades the electrical efficiency of low-income households at no cost to participants, saw a fivefold increase in participation, reaching almost 27,000 homes in 2013. As in previous years, the Business Program for commercial and institutional customers accounted for most of the overall energy savings from electricity conservation programs. Participation in the Retrofit initiative, which provides incentives for energy efficiency improvements (particularly lighting upgrades) in existing commercial and institutional buildings, increased by more than 40 per cent. The New Construction initiative, targeting higher-efficiency new commercial buildings, saw little uptake among builders, which was also the case for its program counterpart in the residential sector.

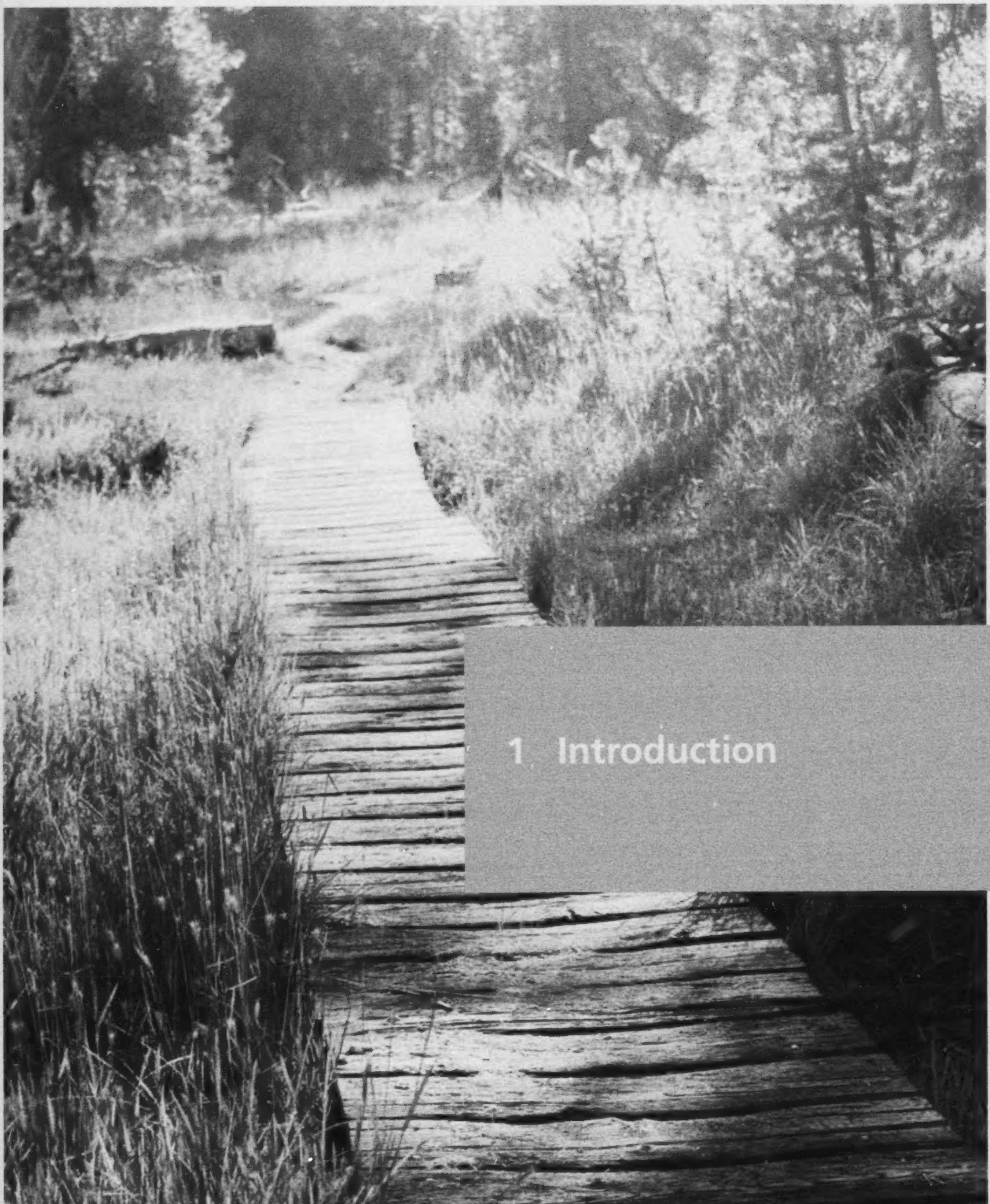
In the industrial sector, 2013 saw encouraging growth in savings achieved by energy managers. Energy managers help companies deliver savings through identifying energy efficiency capital improvements for which incentive funding is available, and by educating businesses to implement low-cost operational improvements that don't require incentives. In contrast to the success of the Energy Manager initiative, only three projects were completed in 2013 under the Process and Systems Upgrade initiative, which offers incentives for energy efficiency investments to distribution-connected industrial customers. While this is an improvement over 2012, when not a single project was completed, it is still disappointing.

Program spending on LDC conservation programs totalled $290.9 million in 2013, a large increase from 2012 ($177.1 million). The majority of the increase ($100 million of the $114 million) flowed directly to participants in conservation programs – particularly businesses – in the form of incentives and related support, with the remainder going to increased administration costs.

The portfolio of province-wide conservation programs has been cost-effective but varies widely for different sectors. The OPA expects that the cost-effectiveness of industrial programs will improve as more conservation projects are completed in future years. The levelized delivery cost of conservation programs (energy efficiency), which allows comparison with the cost of generating the same unit of power, from 2011 to 2013 was 3.7 cents per kilowatt-hour, which is much lower than any new form of electricity generation.

Ontario LDCs have on aggregate achieved approximately 86 per cent of the 2014 energy target and are expected to fall just short of achieving their target. With less than half of the peak demand target achieved through 2013, there is likely no chance that this target will be reached.

In terms of individual LDC Results, larger LDCs are clustered around the mean level of achievement, with smaller LDCs represented on both ends of the performance spectrum. Full numerical results for each LDC are presented in Appendix B. Nineteen LDCs have already met their energy target. Only one LDC (Welland Hydro) has met its peak demand target. It is clear that many LDCs will miss one or both of their 2014 targets, which would put them in breach of their distribution licence conditions.



1 Introduction

The Annual Energy Conservation Progress Report is a valuable resource for Ontarians who want to monitor the pace and scope of the efforts being made to conserve energy in the province. Each year, the report provides an independent review of the effectiveness of Ontario's energy conservation policies, regulations and programs implemented by government ministries, agencies and boards.

Ontario's energy sector is required to achieve measurable, quantitative targets for electricity conservation established by the government, as well as natural gas targets approved by the Ontario Energy Board. The data in this report plot the progress made in achieving these targets by the organizations designated to produce energy savings. The report pays particular attention to the conservation of electricity and natural gas; these are the sectors where most provincial attention is directed and where ratepayers provide money to fund conservation programs. The report also covers the conservation of oil, propane and transportation fuels, sectors where action might be classified as "weak" to date.

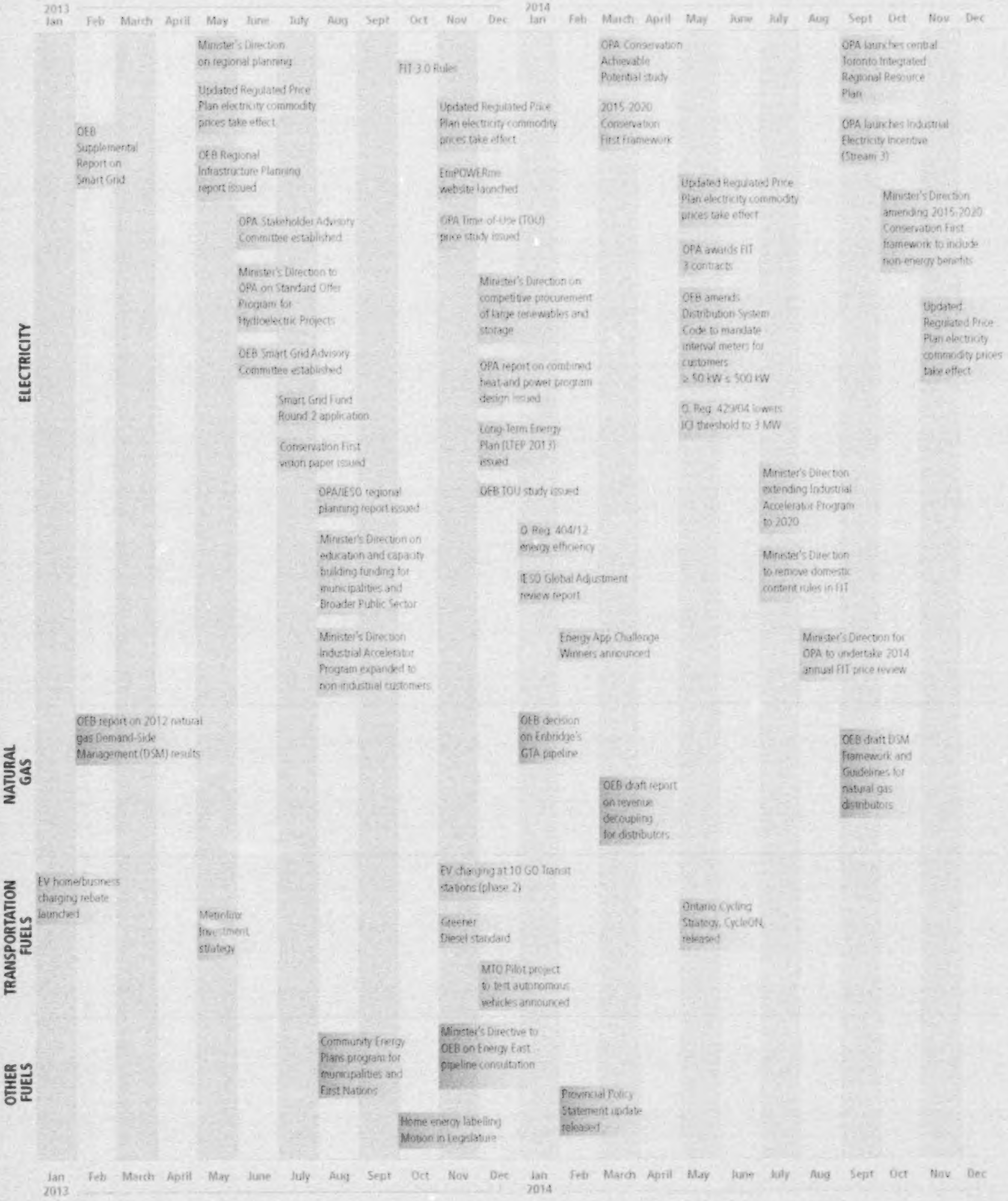
The report provides the only comprehensive summary available to Ontarians on the conservation of all major sources of energy. Readers are encouraged to use the 'at-a-glance' roll-up of results (see Tables 6-8), along with the report's discussion of selected policies and programs, consider our analyses and comments, and then make their own assessment of Ontario's annual progress on energy conservation.

1.1 THE ECO'S REPORTING MANDATE

The Environmental Commissioner of Ontario (ECO) is required under the *Environmental Bill of Rights, 1993* to report annually to the Speaker of the Legislative Assembly of Ontario on the province's progress in energy conservation. Our reporting mandate is to: review progress in reducing or making more efficient use of oil, propane, natural gas, transportation fuels and electricity; measure the achievement of government-established energy conservation targets; and assess barriers to conservation and efficiency.[1]

The ECO's annual energy conservation progress reports were published as two separate volumes from 2009 to 2012. Volume one of each year focused on energy policy developments and was issued in late spring. Volume two, released at the end of the year, was mainly a statistical report describing progress toward government-established targets and natural gas utility conservation targets. Starting with this report, the ECO will publish the annual energy conservation progress report as a single volume. To transition to one volume and better align the report with the implementation of energy policy, this 2014 report covers major policy developments in both 2013 and 2014. As with past reports, the statistical analysis of energy savings results lags by one year because of the time required to receive and verify program results data. Accordingly, this 2014 report reviews 2013 conservation results.

The *Annual Energy Conservation Progress Report – 2014: Planning to Conserve,* analyzes energy conservation policies, examines provincial policy and regulatory activities, assesses the quantitative results (data and outcomes) of energy conservation programs and the progress toward targets.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ELECTRICITY
OEB Supplemental Report on Smart Grid
Minister's Direction on regional planning
Updated Regulated Price Plan electricity commodity prices take effect
OEB Regional Infrastructure Planning report issued
OPA Stakeholder Advisory Committee established
Minister's Direction to OPA on Standard Offer Program for Hydroelectric Projects
OEB Smart Grid Advisory Committee established
Smart Grid Fund Round 2 application
Conservation First vision paper issued
OPA/IESO regional planning report issued
Minister's Direction on education and capacity building funding for municipalities and Broader Public Sector
Minister's Direction Industrial Accelerator Program expanded to non-industrial customers
FIT 3.0 Rules
Updated Regulated Price Plan electricity commodity prices take effect
EmPOWERme website launched
OPA Time-of-Use (TOU) price study issued
Minister's Direction on competitive procurement of large renewables and storage
OPA report on combined heat and power program design issued
Long-Term Energy Plan (LTEP 2013) issued
OEB TOU study issued
O. Reg. 404/12 energy efficiency
IESO Global Adjustment review report
Energy App Challenge Winners announced
OPA Conservation Achievable Potential study
2015-2020 Conservation First Framework
Updated Regulated Price Plan electricity commodity prices take effect
OPA awards FIT 3 contracts
OEB amends Distribution System Code to mandate interval meters for customers ≥ 50 kW ≤ 500 kW
O. Reg. 429/04 lowers ICI threshold to 3 MW
Minister's Direction extending Industrial Accelerator Program to 2020
Minister's Direction to remove domestic content rules in FIT
Minister's Direction for OPA to undertake 2014 annual FIT price review
OPA launches central Toronto Integrated Regional Resource Plan
OPA launches Industrial Electricity Incentive (Stream 3)
Minister's Direction amending 2015-2020 Conservation First framework to include non-energy benefits
Updated Regulated Price Plan electricity commodity prices take effect
NATURAL GAS
OEB report on 2012 natural gas Demand-Side Management (DSM) results
OEB decision on Enbridge's GTA pipeline
OEB draft report on revenue decoupling for distributors
OEB draft DSM Framework and Guidelines for natural gas distributors
TRANSPORTATION FUELS
EV home/business charging rebate launched
Metrolinx Investment strategy
EV charging at 10 GO Transit stations (phase 2)
Greener Diesel standard
MTO Pilot project to test autonomous vehicles announced
Ontario Cycling Strategy, CycleON, released
OTHER FUELS
Community Energy Plans program for municipalities and First Nations
Home energy labelling Motion in Legislature
Minister's Directive to OEB on Energy East pipeline consultation
Provincial Policy Statement update released
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Figure 1: Timeline of Energy Policy in Ontario, January 2013 – December 2014

1.2 A FUEL-BY-FUEL SUMMARY OF THE YEAR'S ACTIVITIES

Overall Progress in 2013 and 2014

The government unveiled several new energy conservation policies in 2013 and 2014, while work on several existing ones was completed. Overall, policy activity, especially for electricity, was much higher than in previous years. The natural gas sector continued to register energy savings during the second year of its current three-year demand-side management regulatory framework; policy work began on the new framework that will replace the current regime starting in 2015. There was stronger, though still moderate, action on substituting current transportation fuels with cleaner ones in order to lower emissions. But, as in previous years, efforts on transportation fuel efficiency and reduction of energy use in this sector was negligible. Conservation activity for the reduction of oil and propane use was completely dormant.

Electricity

The electricity sector fairly hummed with activity. The summary below is not an exhaustive list of all developments, but it covers key initiatives on such major topics as: power system planning, conservation targets, renewable generation, pricing, consumer education, smart grid, product efficiency standards and program delivery.

A half-dozen fundamental policy initiatives were released or in progress during the year:

- Most prominently, an updated Long-Term Energy Plan (LTEP) was released along with the Conservation First white paper.
- The existing 2011-2014 regulatory structure for conservation programs was extended one year to the end of 2015 (as the ECO recommended) to enable a smoother transition to a new framework.
- Work commenced on the design of the new Conservation First Framework for the period 2015-2020.
- The Framework contains a new reduction target of 7 terawatt-hours (TWh) to be achieved in the year 2020 by Local Distribution Companies (LDCs). An additional 1.7 TWh target was established to be achieved through the Industrial Accelerator Program in 2020.
- A Conservation Achievable Potential study – the first in several years – was released in early 2014 to inform the size of conservation targets.
- Two reports on a proposed new approach for regional infrastructure planning were issued.

All of these initiatives are reviewed in the report.

The revised Long-Term Energy Plan, released in December 2013, amended conservation targets contained in the previous LTEP and the Supply Mix Directive of February 2011. The old LTEP's energy (consumption) savings and peak demand targets are superseded by new targets contained in the 2013 LTEP. There is now a single long-term consumption target of 30 terawatt-hours of savings by 2032, which replaces the previous LTEP's target for 2030; there are no interim targets (which existed in the previous LTEP). The previous LTEP's interim peak demand targets have been replaced by a single demand target for the year 2025. Using demand response procurement programs to offset growth in peak, the 2013 LTEP sets a target of a 10 per cent reduction in peak demand by 2025, approximately 2,400 megawatts (MW).

Accordingly, this report does not review progress toward the previous LTEP's 2015, 2020 and 2025 interim energy and peak demand targets or the Plan's 2030 final energy and demand targets since all of these were cancelled by the 2013 LTEP. Future ECO reports will review progress toward the new Conservation First 2020 target and the LTEP's 2025 peak demand reduction and 2032 energy savings targets.

Several directives and policy initiatives related to procurement of renewable generation were added to the policy framework. Most notable among these was the launch of a modified feed-in tariff (FIT) with changes to the price schedule, the size (generating capacity) of projects eligible to apply, and the amounts of each renewable technology to be acquired. A new competitive tender process for procurement of large renewable generation (i.e., projects with a generating capacity greater than 500 kilowatts) will replace the previous FIT rules. Finally, a tender to acquire 50 megawatts of electrical storage capacity was directed by the Minister of Energy.[2]

Two studies were completed that examined load shifting potential from time-of-use rates. The Ministry of Energy launched a website called *emPOWERme* to educate consumers on managing their electricity consumption. A few distribution utilities began pilot tests of computer "apps" (software applications) whose development was funded by the Ministry of Energy to help consumers better understand their power consumption data. These are all discussed in this report.

In other pricing policy activity, the IESO contracted (and issued in early 2014) a report on the cost components that make up the Global Adjustment applied to the price of power. The broad goal of the study was to make electricity prices more reflective of market conditions and the hourly spot price. Throughout 2013, large industrial customers applied to an industrial rate incentive program (Environmental Registry #011-7086), designed to use the current surplus of available generation, enable the Ontario Power Authority (OPA)[*] to receive payments for the power that it otherwise might not collect, and help large industries manage their electrical load.[3] The OPA made seven contract offers to companies under this program in December 2013, and these are currently being negotiated.

The Ontario Energy Board (OEB) released a smart grid report, providing additional guidance to utilities on how the Board will interpret the government's directive to implement smart grid infrastructure. The OEB also established a smart grid advisory committee. The Ministry of Energy launched a second application round for its smart grid fund; 41 applications were received and the ministry offered some $24 million in funding to 17 projects. Negotiation of funding agreements was concluded in November 2014.

In December 2013, the government filed amendments to Ontario Regulation (O. Reg.) 404/12 (Energy Efficiency – Appliances and Products), under the *Green Energy Act, 2009*. The amendments included new or updated minimum efficiency requirements and/or testing methods for 25 products (of which 7 were new products previously not regulated), as well as housekeeping changes to improve regulatory clarity. In total, the regulation now covers 81 products used by households and businesses.

Delivery of the portfolio of saveONenergy conservation programs continued in 2013 through the third year of the framework's 2011-2014 timeframe. These are Tier 1 programs, defined as OPA-contracted province-wide programs, designed and delivered jointly by the OPA and LDCs. Progress toward the 2014 peak demand and energy targets is tracking at a similar pace as reported last year for 2012. While achievement of the demand target (1,330 megawatts peak reduction in 2014) is unlikely (having achieved less than half the target with one year remaining), Ontario may fall just short of the energy target with about an additional 900 gigawatt-hours of savings needed in 2014 (a total of 6,000 gigawatt-hours of savings accumulated over the four-year period). Work by the OPA and LDCs to determine which programs would be extended into 2015 was completed, and some programs were modified.

One new Tier 2/3 electricity program (i.e., regional and local programs approved by the OEB) was introduced in 2013. PowerStream, the LDC serving several communities north of Toronto, launched a program to conserve electricity in commercial refrigerators through audits and equipment upgrades (the Business Refrigeration Incentive).

Natural Gas

Enbridge Gas Distribution and Union Gas continued delivery of demand-side management (DSM) programs in year two of the three-year DSM plan launched last year covering the period 2012-2014. Enbridge's second year results against its target were generally worse than last year, although programs for the residential sector, which accounts for a large amount of the gas supplied by Enbridge, fared better. Union Gas was more successful and increased overall gas savings in 2013, with a large increase in savings from its programs for large-volume industrial customers. The programs are reviewed in detail in Section 3.2 of this report.

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[*] As a result of a government decision in 2014, the OPA and the IESO were merged into one agency, effective January 1, 2015, named the Independent Electricity System Operator (IESO), which will assume the functions of the two agencies

In 2013, Enbridge Gas Distribution applied to the OEB for leave (permission) to construct a natural gas pipeline and associated facilities in and across the Greater Toronto Area, which the Board granted in early 2014. Environmental groups opposed the pipeline on the basis that DSM was a viable alternative to the project. Our report reviews the extent to which demand management was considered by the Board in this hearing.

Oil and Propane

No government programs for the conservation of oil and propane currently exist. As with previous years, no conservation targets for these fuels or targets for reduction of thermal energy use have been developed by the government. The government programs terminated in 2012 (i.e., the Ontario Home Energy Savings Program and the Ontario Solar Thermal Heating Incentive Program, which were directed at reducing the use of multiple fuels, including oil and propane) were not replaced in 2013 or 2014.

Transportation Fuels

There was very little activity in 2013 and 2014 to reduce or make more efficient use of transportation fuels (e.g., ridesharing to reduce single occupant vehicles). The government seems almost exclusively focused on fuel substitution for emission reductions, but even these efforts are modest. During 2013, the Ministry of Transportation (MTO) continued to deliver the electric vehicle incentive program; solid gains were made in 2013 with the number of electric vehicles more than doubling compared to the same time last year. Achieving the target, however, will require much greater and more rapid adoption of electric vehicles.

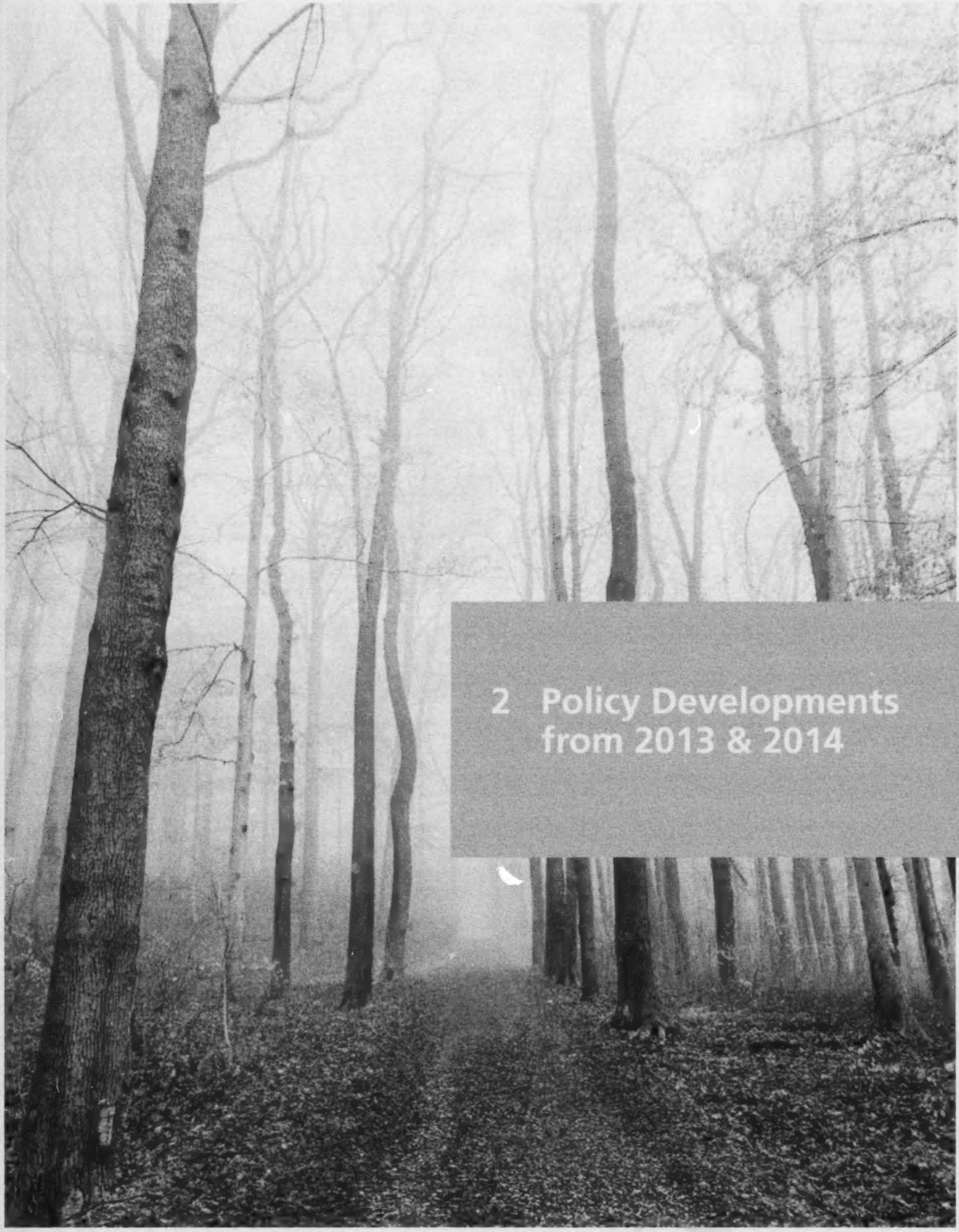
In late 2013, the Ministry of the Environment and Climate Change (MOECC) posted a proposal notice for a greener diesel regulation (Environmental Registry #012-0363), as the transportation sector is the largest contributor of greenhouse gas emissions in Ontario. The regulation took effect in April 2014. It will expand the use of diesel fuels with better environmental performance in order to improve air quality and reduce emissions that cause climate change. In 2013, the Ministry of Energy undertook no measurable activity toward a target for the substitution of lower carbon transportation fuels (i.e., the Low Carbon Fuel Standard, which requires a 10 per cent reduction in carbon intensity of transportation fuels by 2020); ministry activity consists of monitoring California's introduction of its low-carbon fuel standard and the associated compliance paths, as well as monitoring MOECC's implementation of the above-noted low-carbon diesel regulation.

In the longer term, three initiatives announced in late 2013 and early 2014 have the potential to reduce energy used in the transport sector.

In December 2013, MTO posted an information notice for a pilot project to test autonomous vehicles, or what are commonly known as driverless cars (Environmental Registry #011-9707). In a document summarizing the proposal, MTO listed improved fuel efficiency and reduced vehicle emissions as potential benefits of wide adoption of autonomous vehicles. MTO stated that the pilot project has not yet begun and the ministry presently has no plans to collect any data on autonomous vehicles.[4] The ministry has not estimated the energy reductions because of uncertainty over such factors as the availability of vehicles and their effect on vehicle-kilometres travelled. The ministry plans to consult stakeholders on issues including the collection of data on fuel efficiency and emissions.

The 2014 Ontario Budget announced the addition of high-occupancy vehicle lanes on Highway 401, in the regions of Halton and Peel, starting in 2019-2020. The budget also proposed to dedicate revenues from possible high-occupancy toll lanes on Ontario's 400-series highways to transportation infrastructure investment (e.g., transit). MTO indicated that it currently does not have sufficient data to model and estimate the potential energy savings from the high occupancy vehicle and toll lane network, but it intends to build capacity to do so.[5]

The province announced that it is moving forward with plans for a high speed rail line. (In previous years, MTO stated an intention to review the next steps in planning a high-speed rail link between Windsor and Quebec City). The government began an environmental assessment for the London, Kitchener-Waterloo, and Toronto line in December 2014.[6]



2 Policy Developments from 2013 & 2014

2.1 CONSERVATION FIRST?

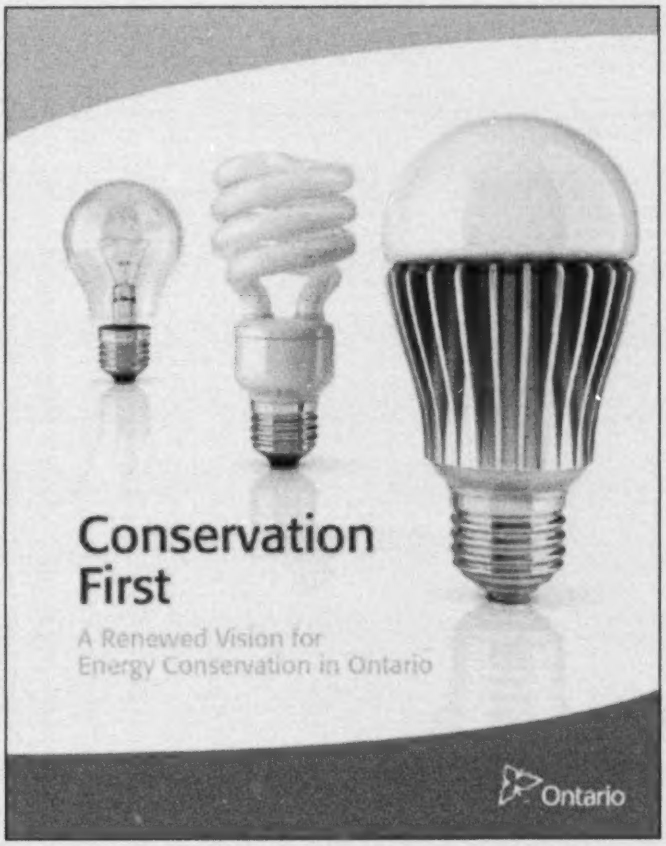
2.1.1 A NEW VISION FOR CONSERVATION IN ONTARIO

***"Conservation should be the first resource considered in meeting Ontario's electricity needs."*[7]**

The Ontario government first expressed this progressive principle in a discussion paper, *Conservation First: A Renewed Vision for Energy Conservation in Ontario*, released July 16, 2013. The paper stated that conservation is "the cleanest and least costly energy resource." It also noted that conservation investments between 2005 and 2011 helped Ontario avoid building expensive new electricity generating plants that would have cost almost four billion dollars. With other jurisdictions aggressively committed to conservation and energy efficiency, the paper proposed that conservation should play a larger role in Ontario's energy planning going forward.

The *Conservation First* discussion paper was split into two parts:

- Part 1 described the "conservation first" vision and briefly mentioned several potential new conservation policies and initiatives that could be developed to support this vision; and
- Part 2 set forth general proposals for a new framework for delivering electricity conservation programs over the 2015-2020 period that would replace the existing Conservation and Demand Management (CDM) Framework scheduled to wind down at the end of 2014.



Conservation First

A Renewed Vision for Energy Conservation in Ontario

Ontario

However, the government did not commit to any specific mechanisms – or even list its preferred options – for achieving the *Conservation First* objectives.

Instead, the Ministry of Energy sought public input on the ideas expressed in the discussion paper and posted *Conservation First* on the Environmental Registry as a policy proposal (#011-9614). Consultation was conducted in parallel with the government's review of the Long-Term Energy Plan (LTEP); the government stated that conservation should play a more prominent role in the province's long-term energy planning. Similar to the LTEP review, feedback on the *Conservation First* vision was guided by 20 open-ended questions about how new conservation targets could be set and how the new conservation framework could be designed.

The consultation period for the *Conservation First* paper ended on September 16, 2013, and 267 comments were received in response to the proposal notice posted on the Registry. In general, commenters strongly supported the government's vision to prioritize conservation before new generation.

Comments with respect to energy conservation focused broadly on:

- The need for a long-term and adequately-funded commitment to conservation that includes consideration of cost-effectiveness and avoided costs to ensure conservation is fairly evaluated against new supply options;
- Support for a broader definition of conservation and demand management activities that includes storage, behind-the-meter generation, line losses and the smart grid;
- The need to integrate conservation into regional energy planning to target specific system needs that provide the province with the most value for conservation; and
- Support for targets (peak demand and energy) based on the Local Distribution Companies' (LDCs') potential that represent a minimum amount of achievable savings.

2.1.2 IMPLEMENTING *CONSERVATION FIRST*

Since consultation on *Conservation First* closed in September 2013, the Ministry of Energy has taken swift action in some areas, but has stalled in others.

The key actions taken by the ministry to date are:

- Releasing the LTEP, which establishes the role of conservation in provincial electricity system planning and makes commitments to implement some of the other *Conservation First* proposals, such as on-bill financing (December 2, 2013);
- Directing the Ontario Energy Board (OEB) to establish a new conservation framework for natural gas distributors covering the 2015-2020 period and to review how to integrate conservation into electricity and natural gas infrastructure planning at the regional and local levels (March 26, 2014);
- Directing the Ontario Power Authority (OPA) to implement elements of the LTEP, including the transition of demand response programs to the Independent Electricity System Operator (March 31, 2014); and,
- Establishing the new policy framework for the delivery of electricity conservation programs between 2015 and 2020, through directions to the OEB (March 26, 2014) and the OPA (March 31, 2014).

The Ministry of Energy posted a policy decision notice for the *Conservation First* proposal on the Environmental Registry on September 9, 2014, almost a year after the consultation period closed and six months after directives were issued to the OPA and the OEB for the new electricity and natural gas conservation policy frameworks. The decision notice mentioned these directives, as well as the release of the LTEP, but did not provide an update on those other initiatives proposed in *Conservation First* that had not been mentioned in the LTEP or in the follow-up guidance to the OEB and OPA.

The ECO asked the Ministry of Energy to provide a status update on these proposals. The proposals in question and the ministry's response are summarized in Table 1. With one exception (spreading the cost of conservation over the life of investments), the ministry stated that all of the initiatives proposed in *Conservation First* are still under active consideration.

Table 1: Progress Made Toward *Conservation First* Proposals[8]

Conservation First Proposal	Ministry of Energy Comment on Progress
"The cost of conservation could be spread over the life of the investment, as is done with investments in supply."	"*Conservation First* proposed that the cost of conservation initiatives could be spread over the life of the investment, as is done with investments in supply, which could reduce short-term rate impacts and provide a more equitable sharing of costs across all ratepayers, current and future, which could benefit from the programs. During the *Conservation First* consultation and engagement process this proposal did not receive strong support. Analysis on the postponement of payment through an amortization mechanism showed this would attract interest on outstanding amounts that would be recovered from ratepayers, decreasing conservation costs in the short-term, but significantly increasing costs in the long-term. As a result, a decision was made not to pursue the proposal at this time."
"Voluntary dynamic pricing programs could provide additional benefits to customers that shift their consumption to low demand periods."	"The Ontario Energy Board (OEB) plans to commence a fulsome review of electricity pricing for Regulated Price Plan customers (residential and small business) this fall [2014]. The ministry will work with the OEB to examine pricing options, including voluntary dynamic pricing over the course of this review. Pending execution of transfer payment agreements, the ministry is also sponsoring two dynamic pricing pilots through its Smart Grid Fund."
"Rating systems for buildings could allow consumers to benchmark the relative energy efficiency of various properties and inform their investment decisions."	"The ministry is currently examining the potential for energy rating systems for the residential and commercial sectors. For the residential sector, the ministry is exploring options for home energy rating and disclosure at the time of sale. For the commercial sector, the ministry is evaluating options for implementing energy reporting and benchmarking."
"The province could also explore a revolving fund concept to help finance energy efficiency retrofits for residential and business customers."	"The ministry is currently undertaking analysis of a proposal for a revolving fund to finance energy efficiency retrofits."
"Reducing line losses generally involves upgrading technology and equipment, and it may be appropriate to allow utilities to recover the associated costs."	"The ministry continues to work with the OEB to encourage grid modernisation and to promote the identification and realisation of efficiencies in the distribution of electricity."
"The strength of broader public sector (BPS) organizations' conservation plans could be among the considerations when evaluating funding requests to the province."	"The ministry will be conducting analysis of BPS conservation plans and will be reaching out to relevant ministries and sector organizations to help support the implementation of conservation plans by BPS organizations."
"One approach being considered is to automatically adopt leading efficiency standards of other jurisdictions in North America where it would improve Ontario's own regulatory process."	"Ontario is the only jurisdiction in Canada that allows for early compliance and rolling incorporation – mechanisms that assist industry in transitioning their products to meet new efficiency standards in advance of regulatory amendments."

ECO Comment

Consultation Process

The ECO commends the Ministry of Energy for using the Environmental Registry to consult on a policy proposal with such clear environmental significance as *Conservation First*, and for posting a decision notice on the Registry for this proposal, as required under the *Environmental Bill of Rights, 1993*. The ECO has been critical of the ministry in the past for failing to use the Registry.[9]

However, the quality of the ministry's decision notice left something to be desired. While the Ministry of Energy posed a series of 20 questions in *Conservation First* to guide consultation, the public's response to these questions was not addressed in the decision notice. The decision notice provided minimal information and did

not systematically address which *Conservation First* proposals would be adopted (or rejected) or provide an explanation of why. As noted above, the ECO has learned through a follow-up request that the ministry has yet to make a final decision on some proposals; however, it has decided to reject at least one proposal, in part due to negative feedback received from the public during consultation. The purpose of the Registry decision notice is to help the public understand how ministries make decisions. The ECO urges the ministry to tell the public when certain proposals have been rejected and to explain why.

In most cases, there is very little meat on the bones of the policy proposals in *Conservation First*, making a second round of consultation on the specifics necessary, in the ECO's view. The ECO also notes the need for consultation using the Registry for follow-up actions, such as directives and regulations that provide the legal authority for implementing *Conservation First*. Finally, the ministry did not use the Registry to consult on its directives to the OPA and OEB that followed from *Conservation First*.

Can We Achieve Conservation First?

Moving now from the review of *Conservation First* to its substance, the Ministry of Energy's actions have confirmed that it will seek to apply the principle of putting conservation first in electricity system planning at all geographic levels – local, regional, and provincial – and in natural gas system planning. It is difficult to find fault with this concept, and it is not surprising that it was strongly supported by the public. Indeed, the ECO has long argued that energy conservation has been undervalued and could play a much larger role in meeting Ontario's energy needs. However, scratch beneath the surface and it becomes obvious that this motherhood phrase hides a number of difficult policy choices that the government has yet to make.

One key issue relevant to all spheres of energy system planning is how to compare the costs and benefits of energy conservation and energy supply. The government's commitment to putting conservation first is often qualified by the phrase "where cost-effective."[10] This should provide great opportunity for conservation initiatives since existing conservation programs have consistently delivered large savings cost-effectively and studies suggest that the untapped potential is much larger (see Section 2.2).

However, until very recently, the tests used in Ontario to compare the cost of conservation relative to new energy supply placed no value on the environmental benefits that conservation offers, such as avoided greenhouse gas emissions. This is a systemic concern which undervalues energy conservation and limits Ontario's ability to tap its full potential. In early October 2014, the Ministry of Energy informed the ECO that it "is considering whether to provide any additional guidance as to whether the costs and benefits of externalities, such as environmental impacts, should be included when assessing the cost-effectiveness of conservation."[11] Later in the month, the Minister directed the OPA to modify its cost-benefit analysis to account for the "non-energy" benefits of conservation programs, including environmental, economic and social benefits.[12] Initially, this will be done by including a 15 per cent adder to roughly reflect the benefits of conservation, an approach that will be refined in future years. For now at least, this methodology only applies to the electricity sector. Both the current natural gas framework and its proposed successor ignore environmental benefits.[13]

It is unknown if the ministry will direct the OEB to adjust the treatment of costs and benefits in the natural gas framework to be consistent with the methodology that it has recently mandated for the electricity sector. The issue was previously raised in 2011 when the OEB developed the natural gas conservation regulatory framework for the 2012-2014 period. Board staff recommended that the cost-benefit tests used by utilities be revised to incorporate environmental externalities, like carbon emissions, but the OEB did not act on this recommendation.[14] The ECO disagreed with the OEB's decision and recommended that the *Ontario Energy Board Act* be amended so that the OEB's objectives included having regard for these environmental costs.[15] The OEB is considering the treatment of costs and benefits in a regulatory proceeding that is underway, but as it currently stands, the natural gas conservation regulatory framework is misaligned with the electricity framework.

The ECO commends the Ministry of Energy for recognizing the need to account for the environmental benefits of energy conservation in its economic analyses. The ECO hopes that this action signals that the government intends to strengthen the link between its energy policy and its efforts to achieve its climate change targets.

The ECO believes that energy conservation brings valuable environmental benefits – not only by reducing greenhouse gas emissions, but also by improving air quality and reducing land use impacts from the extraction, production and delivery of energy – that should not be ignored.

Appropriately valuing conservation is only one of the policy issues that need to be addressed in order to make the vision of *Conservation First* a reality.

In the next six sections of this report, the ECO examines other key questions, with a particular focus on how conservation is integrated into energy system planning in both the electricity and natural gas sectors.

- *Has the government set its long-term electricity conservation target at a suitably ambitious, but still achievable, level?* Section 2.2, "Determining Ontario's Conservation Potential" looks at the background assumptions that influenced how Ontario set its Long-Term Energy Plan conservation target.
- *How can the government be held accountable for putting conservation first in system planning when it continually moves the goalposts, eliminating interim targets and pushing its conservation target ever farther away into the distant future?* Section 2.3, "Ontario's Power Struggle – Can We Achieve Balance?" reviews the Long-Term Energy Plan, Ontario's guidance document for the next 20 years of provincial electricity system planning.
- *Will greater freedom encourage electric utilities to design and deliver more innovative conservation programs?* Section 2.4, "The New 2015-2020 Framework for Electricity Conservation Programs" discusses the changing roles of the OPA, the OEB and electric utilities under the new framework for electricity conservation programs.
- *Can consensus be reached on how to best meet regional electricity needs if local residents prefer conservation while system planners prefer new generation or transmission?* Section 2.5, "Regional Energy Planning" raises this question in light of recent changes to the regional electricity system planning process, which the government opened up for review in response to strong local opposition to two planned natural gas-fired electricity generating stations in Oakville and Mississauga.
- *Do corporate culture and financial incentives bias energy utilities to favour 'hard' infrastructure investments over conservation?* Section 2.6, "A New GTA Gas Pipeline – Could It Have Been Avoided Through Conservation?" analyzes the recent OEB decision to approve one billion dollars in new spending on gas pipeline infrastructure in southern Ontario. Environmental groups argued that this pipeline could have been avoided through targeted conservation efforts. The ECO examines whether new policy guidance from the Ministry of Energy and the OEB will change the way that decisions are made for future natural gas infrastructure projects.
- *Finally, how do we encourage all Ontarians to play a part in energy conservation?* The government's previous conservation vision, "Building a Culture of Conservation," was promoted for roughly the past ten years. However, it mainly served as an empty slogan with few efforts to concretely operationalize the vision. The most recent metrics show overall engagement by Ontarians in the culture of conservation had declined to its lowest-ever point at the end of 2013.[16] The "culture building" vision is never mentioned in current government news releases and seems to have been discarded. Section 2.7, "Embedding the Customer in Conservation" looks at how pricing policy and improved access to energy information can drive greater participation in conservation.

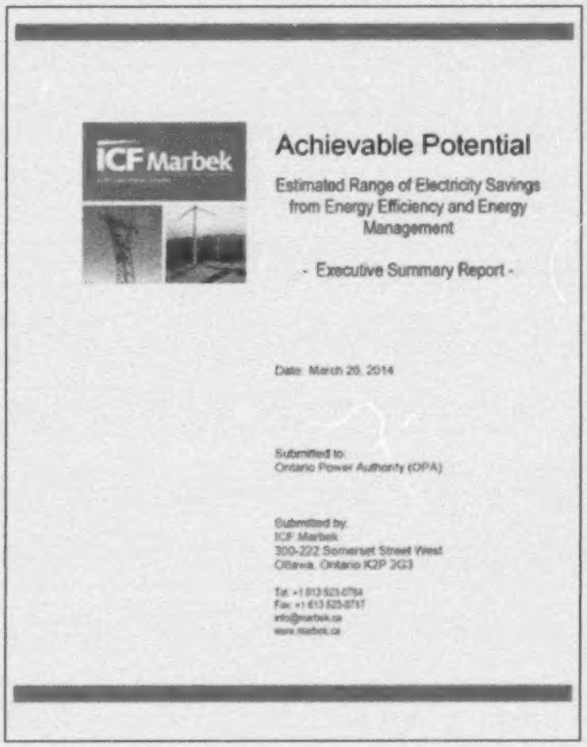
Putting conservation first is the right approach, and the ECO congratulates the Ministry of Energy for taking this step. However, it is only a first step. The issues raised in the following sections should make it apparent that the depth of the government's commitment to placing conservation first will be revealed only through the government's actions in the years to come.

2.2 DETERMINING ONTARIO'S CONSERVATION POTENTIAL

2.2.1 INTRODUCTION

With Ontario's adoption of a *Conservation First* approach, the government announced its intention to invest in electricity conservation before new generation, where cost-effective. This begs a number of questions. How much conservation can Ontario reasonably achieve? How much will this conservation cost? What should Ontario's electricity conservation targets be?

To answer these questions, the Ontario Power Authority (OPA) commissioned a study, *Achievable Potential: Estimated Range of Electricity Savings from Energy Efficiency and Energy Management*, which was publicly released in March 2014. The study was conducted by the consulting firm ICF Marbek, in collaboration with the OPA, to assess the potential contribution of electricity conservation to Ontario's long-term power system needs. The study estimates the conservation potential for Ontario as a whole, as well as for the ten regional zones established by the Independent Electricity System Operator (IESO) within the province.



ICF Marbek

Achievable Potential

Estimated Range of Electricity Savings from Energy Efficiency and Energy Management

- Executive Summary Report -

Date: March 20, 2014

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Ontario Power Authority (OPA)

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The study's results were used by the Ministry of Energy primarily to set the size of three key electricity conservation targets: (1) the long-term electricity conservation target of 30 terawatt-hours (TWh) in 2032, which is contained in the 2013 Long-Term Energy Plan[17] (see Section 2.3); (2) the target of 7 TWh in 2020 from Local Distribution Company-led (LDC) programs, which is contained in the 2015-2020 Conservation First Framework (see Section 2.4); and (3) the target of 1.7 TWh in 2020 from the Industrial Accelerator Program. The study's conclusions gave the ministry confidence that these were realistic targets that could be achieved cost-effectively (i.e., at lower cost than the equivalent amount of generation).

The study was also commissioned to estimate the total investments needed by program administrators (e.g., OPA and LDCs) to acquire the identified savings potential through conservation program delivery in Ontario. Since so many key long-term decisions rest on the findings of this study, there is merit in examining the study's design and assumptions in some detail.

2.2.2 STUDY METHODOLOGY

The study determined potential electricity savings from conservation between 2012 and 2032 relative to a projection of Ontario's future electricity demand (termed the "reference case"). The reference case represents a "do nothing" approach and shows what Ontario's use of electricity would be in the absence of any new electricity conservation initiatives (such as new regulations, codes, standards or programs) and provides a baseline from which to compare future electricity savings. While the forecast assumed a certain rate of "natural conservation" undertaken independent of the effects of government policy or programs, its primary assumption was no new government conservation initiatives after 2005.[18] The reference case demand forecast was generated by the OPA's end use forecaster model and was not published in the study. In the absence of this baseline data, evaluating future achieved savings relative to this demand forecast will be difficult.

2.2.2.1 WHAT IS POTENTIAL?

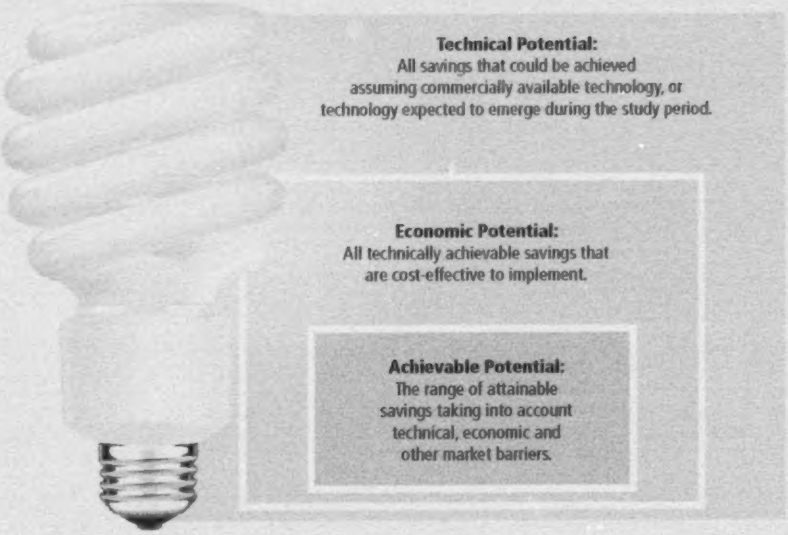

Technical Potential:
All savings that could be achieved assuming commercially available technology, or technology expected to emerge during the study period.
Economic Potential:
All technically achievable savings that are cost-effective to implement.
Achievable Potential:
The range of attainable savings taking into account technical, economic and other market barriers.

Figure 2: Defining Potential

"Potential" can be classified and described as technical, economic or achievable potential (see Figure 2). Essentially, *achievable potential* is the range of attainable savings under a certain set of policies, recognizing that 100 per cent adoption of conservation measures is usually impossible. It considers the technical, economic and market barriers, as well as other practical or political realities, which must be overcome to deliver cost-effective energy efficiency programs and to convince customers to participate in them.

The Achievable Potential study imposed an economic screen on most measures before including them. Therefore, the study's estimates of technical potential should be viewed as a hybrid of economic and technical potential and, as such, should be considered conservative.

Estimating Technical Potential: To generate estimates of Ontario's achievable potential, the study first calculated the province's technical conservation potential.

Relying on the OPA's end-use forecaster model, the study estimated the potential energy savings if all cost-effective conservation measures were adopted to the full extent possible.[19] The end-use forecaster model deemed a conservation measure to be cost-effective if the savings exceed the cost of the measure over a specified time period (based on projected electricity prices). Many of the assumptions in the OPA model were not explained in the public report, such as the role of codes and standards, how technology market share is modelled to change in the absence of government action, and the assumed costs of energy efficiency measures. Some additional savings measures (mostly behavioural measures) were not included in the OPA's end-use forecaster model. The study estimated those savings based on results from potential studies in other Canadian jurisdictions, adapted to the Ontario context using OPA market research.[20]

Estimating Achievable Potential: To translate the technical savings potential into a realistically achievable savings potential, it is necessary to estimate participation rates – the percentage of potential customers that will actually adopt an energy efficiency measure. Participation rates were initially estimated based on previous studies done for other jurisdictions. For key energy efficiency technologies, more in-depth analysis was performed, including how the design of a conservation program might affect the participation rate. The study modelled how different levels of financial incentives and enabling activities (e.g., consumer education, marketing and technical assistance) could affect the range of achievable savings based on data gathered from interviews with sector experts to estimate customer participation rates for the chosen measures.[21] Where applicable, the results were then extrapolated to other energy efficiency measures.

The results of this analysis were two estimates of achievable potential – upper and lower achievable potential – based on different assumptions about program design. Upper achievable savings assumed that programs would offer incentives that would provide a one-year customer payback (i.e., investment in the measure would be recouped by the program participant within one year through lower energy costs) and would be marketed aggressively. Lower achievable savings assumed incentives that would provide a two-year customer payback, with lower levels of marketing. The study also estimated the program costs to electricity ratepayers of offering conservation programs that would deliver the lower and upper achievable potential savings.

2.2.3 RESULTS – HOW MUCH POTENTIAL?

The Next Generation of Electricity Conservation Targets

If all technically feasible savings were realized, the study forecast that conservation could reduce Ontario's electricity consumption by up to 24 per cent (41 TWh) in 2032 relative to the reference case (see Figure 3). Even taking into account technical, economic and market barriers, conservation could realistically reduce electricity consumption by up to 18 per cent in 2032 relative to the reference case, based on the upper achievable potential estimate. The 18 per cent estimate is equivalent to 30.7 TWh and provided the foundation upon which the 2013 Long-Term Energy Plan electricity conservation target (30 TWh in 2032) was developed. These estimates include the conservation potential of conservation programs, as well as the impacts of past and expected changes to Ontario's building code and product standards based on OPA's estimates.

The study identified 17.6 TWh of total upper achievable savings in 2020 (see Figure 3).[22] This estimate includes several categories of conservation that are not covered by LDC conservation programs. These were subtracted to obtain 8.6 TWh of upper achievable conservation from LDC programs between 2015 and 2020. The ministry then determined the Conservation First target for LDC programs (7 TWh in 2020) based on a "moderate point between the upper and lower achievable potential" identified in the study.[23]

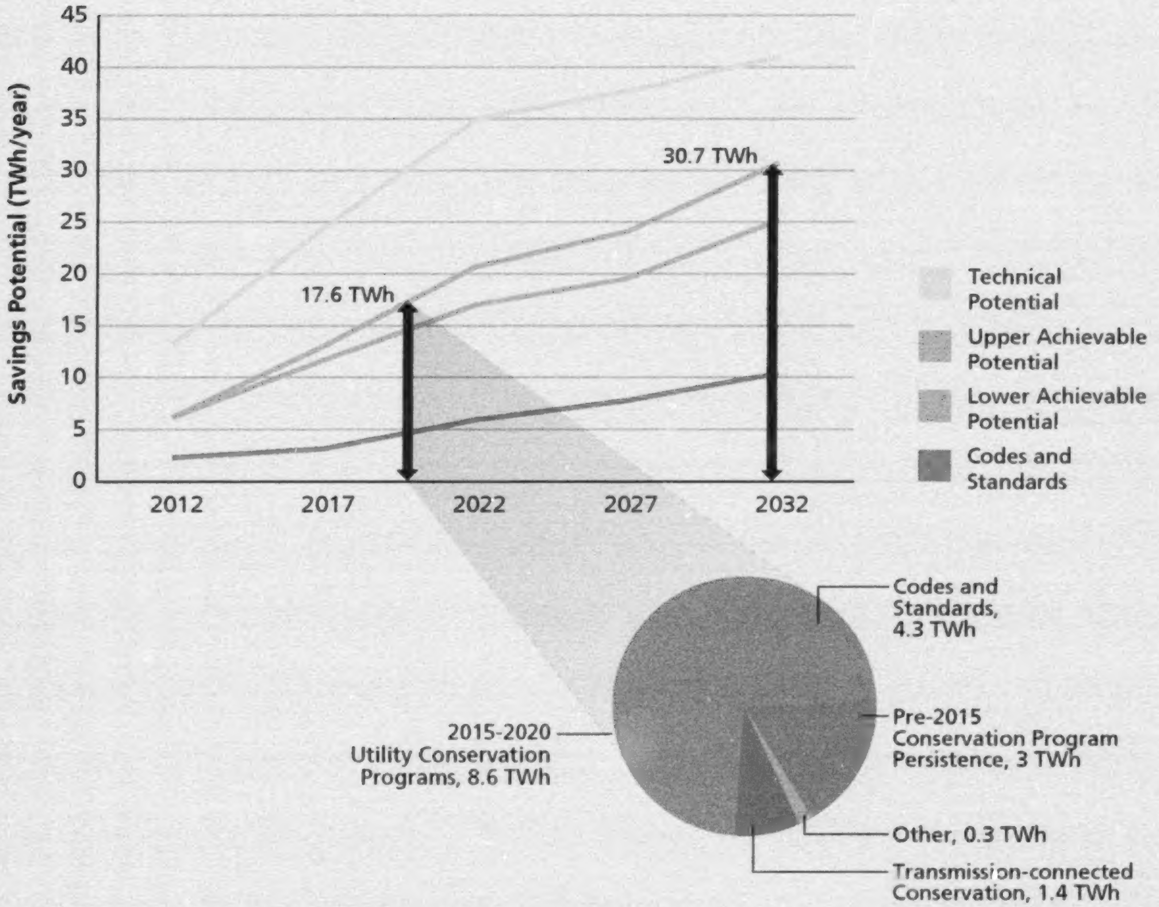


Figure 3: Technical and Achievable Savings Potential 2012-2032

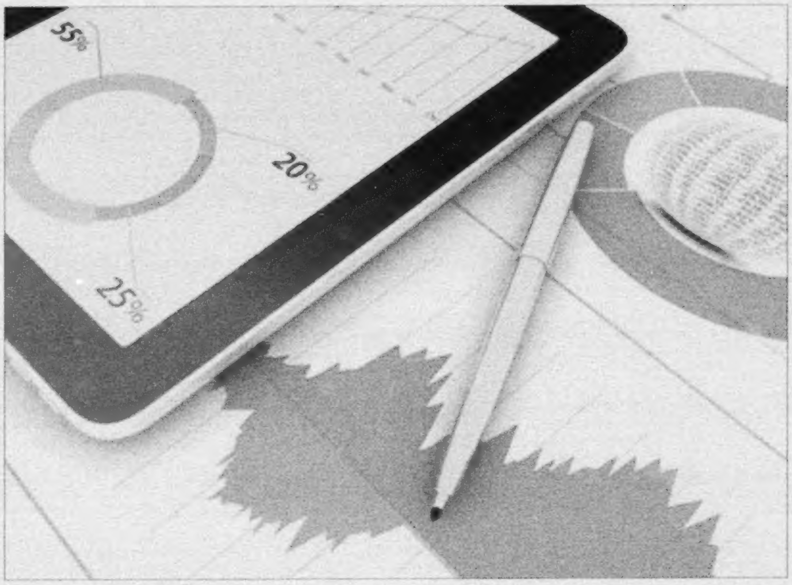
Source: ICF Marbek 2014 [24]

The study attempted to account for variations across regions that could affect conservation potential (e.g., differences in building types and market conditions), but it is not clear how accurately the study reflects the specifics of each LDC service territory. The OPA has developed a Regional Potential Calculator using the study results to help LDCs generate estimates of local potential (although this approach was not used to directly calculate the individual LDC targets that comprise the Conservation First 2020 target). At the request of LDCs, another achievable potential study will be conducted by 2016 that reviews the 2020 targets and includes a "bottom-up" assessment that takes greater account of the variation across LDCs (see Section 2.4).[25]

Sector-specific Conservation Potential and the Cost of Conservation

The study estimated the average cost to the grid operator to procure savings to 2022 was between 2.5 and 3.7 cents per kilowatt-hour of electricity saved, excluding any incremental costs paid by customers for energy efficiency measures. In general, energy savings in the commercial and industrial sectors are less expensive to procure than savings in the residential sector.

Approximately 47 per cent of the 2032 upper achievable savings estimate (30.7 TWh) could be realized from the commercial sector, followed by 31 per cent from the residential sector, and 22 per cent from the industrial sector. While the industrial sector accounts for the least savings in absolute terms, it is forecast to experience the largest growth in savings.



ECO Comment

The study demonstrated that an abundance of low-cost conservation opportunities exist and that conservation can play a major role in meeting Ontario's electricity needs in the future. The study's publication represents a positive step forward for government transparency on target development. However, transparency could be further enhanced if the OPA provided more public information on its end-use forecaster model.

Many elements of the study are difficult to evaluate. The study relied heavily on data and outputs from the OPA model without sharing the assumptions on which the OPA model was based. Moreover, the way in which the study results were used, after they were handed off to the Ministry of Energy and OPA to develop the Long-Term Energy Plan and Conservation First targets, has never been fully explained. While the ministry essentially chose the "upper achievable potential" estimate from the study as its 2032 conservation target, it selected a point partway between the lower and upper achievable potential estimates for the 2020 Conservation First target. The ministry has never explained why different approaches were used in setting the two targets or whether it agrees with all of the conclusions from the study.

The study results will ultimately influence expenditures on demand-side and supply-side resources and the programs that deliver them. So it is important to note that the study employs some conservative approaches to calculating conservation potential. Because measures were required to pass an economic screen prior to inclusion, the study did not calculate true technical potential Instead, technical potential was constrained by economic limitations. Typically based on best practices, most achievable potential studies do not impose economic screens at that stage of the analysis. This approach likely resulted in more modest estimates of technical savings and had a knock-on effect on the range of achievable savings identified. The ECO suggests that future studies should begin with a true assessment of the full, unconstrained technical potential, before modelling how changes to certain key variables that underlie cost-effectiveness testing affect the estimates of economic potential. Such variables might include future electricity prices and the value of environmental benefits, such as avoided greenhouse gas emissions.

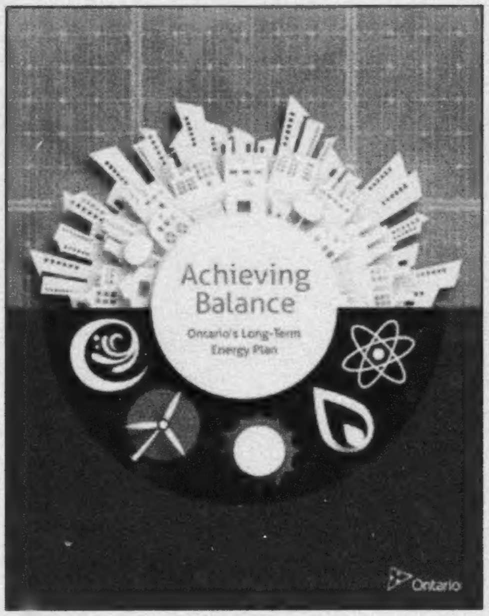
However, having noted these concerns, the ECO also recognizes that there are many uncertainties in translating theoretical potential to actual program savings. Given the results of actual conservation performance from 2005 to 2013, the ECO believes that the final conservation targets chosen by the ministry are quite aggressive.

Achievable potential studies can certainly help assess how a given market might respond to conservation programs. However, they are not precise forecasts and should not be viewed as the upper limit of demand reduction. Modelling market dynamics across all customer classes over long periods of time is complex for both demand- and supply-side resources. Thus, the ECO is encouraged by the government's commitment to provide an updated achievable potential study every three years.[26]

2.3 ONTARIO'S POWER STRUGGLE – CAN WE ACHIEVE BALANCE?

2.3.1 INTRODUCTION

When it comes to energy, we want it all. We expect our energy supply to be reliable. As consumers, we want our homes and businesses to be powered affordably. And as responsible global citizens, we want power to be clean and low-carbon. Balancing the trade-offs between reliability, competitive pricing and low carbon commitments is a challenge – one that was mapped out at the provincial level for the first time in 2010 in the government's LTEP.



The LTEP provides an overview of the long-term development of Ontario's electricity and energy system needs, and broadly sets out the investment plans for the power system over the next 20 years. The government says it will update this plan every three years.

In 2013, the government announced it would conduct a review of its 2010 LTEP. The ECO discussed this document in our *Annual Energy Conservation Progress Report – 2010 (Volume One).* According to the Minister of Energy, the two-month review of the LTEP, which also included consultation on a new *Conservation First* vision for Ontario, was the most comprehensive consultation and engagement process the ministry had ever undertaken.[27] In total, 1,245 comments were received and considered via the Environmental Registry; the 2013 LTEP, *Achieving Balance: Ontario's Long-Term Energy Plan,* was the outcome.

The 2013 LTEP is "designed to balance the following five principles: cost-effectiveness, reliability, clean energy, community engagement, and an emphasis on conservation and demand management before building new generation."[28] The 2013 Plan, supported with detailed data produced by the OPA,[29] painted a rosy picture of a well-managed electricity system that provides Ontario with an adequate and diverse supply mix; 27 per cent of electricity production currently comes from renewable resources and 5 per cent from conservation. The Plan also forecast electricity demand growth at a rate lower than previously anticipated and the use of coal phased out by the end of 2014.[30]

But does the 2013 LTEP accurately reflect reality? This chapter reviews the energy conservation and renewable generation elements of the new LTEP. Key features include the new long-term consumption reduction target and the loss of interim peak and energy reduction targets that had been set in the 2010 LTEP. The new Plan also promises a comparatively slower build-out of renewables than the previous Plan and adds new conservation initiatives.

2.3.2 UPDATING THE LONG-TERM ENERGY PLAN

The Ministry of Energy posted a policy proposal on the Environmental Registry (#011-9490) in July 2013, which included the discussion document *Making Choices: Reviewing Ontario's Long-Term Energy Plan,* and asked the public to comment on 20 broad questions exploring options for Ontario's long-term energy system development. After a series of consultations held over the summer with municipalities, Aboriginal communities, stakeholders and the public, the government released *Achieving Balance: Ontario's Long-Term Energy Plan* in December 2013. The Ministry of Energy posted its decision notice on the Registry on February 4, 2014.

The 2013 LTEP outlines, at a fairly high level of detail, the investment plans for Ontario's power system to 2032. To the credit of the ministry and the OPA, additional background details on the assumptions used in the LTEP were published on the OPA's website. The release of the 2013 LTEP upholds the 2010 LTEP commitment to update the Plan every three years. Notably, the 2013 LTEP also announced that the government will publish an annual energy report,[31] which will outline progress on the LTEP's implementation. The following discussion provides a summary of the energy conservation and renewable generation elements of the 2013 LTEP.

2.3.3 CONSERVATION FIRST IN THE 2013 LTEP

Putting conservation first, before new generation, is the guiding principle of the 2013 LTEP. In addition to the *Making Choices* document, the LTEP review was also guided by the government's vision paper *Conservation First: A Renewed Vision for Energy Conservation in Ontario*, published early in the LTEP review period. The paper presents the fundamental principle that Ontario will invest in conservation before new generation, where cost effective. The vision paper and its proposals are described in more detail in Section 2.1.

The 2013 LTEP echoed many of the vision paper's significant proposals in the Plan's chapter "Putting Conservation First." These proposals included the government's intention to:

- Make new financing tools available to consumers starting in 2015, such as on-bill financing, that encourage consumers to invest in energy efficient retrofits;[32]
- Evolve existing demand response programs and introduce new demand response initiatives;
- Improve consumer energy literacy through behavioural initiatives, such as expanded social benchmarking (see Section 2.7);
- Examine the potential to evolve the microFIT program to a net-metering program in order to allow homeowners to use solar-generated power to offset their own electricity needs; and
- Develop a new electricity "conservation first" framework to support the delivery of conservation programs in Ontario (see Section 2.4).

The Ministry of Energy, the province's energy agencies and regulator continue to move these proposals forward, some faster than others.

2.3.4 THE LONG-TERM OUTLOOK: MANAGEABLE GROWTH AND ADEQUATE DEMAND-SUPPLY BALANCE

According to the 2013 LTEP and its supporting background documents, electricity demand will remain relatively flat this decade, thanks to ongoing conservation actions, structural change in Ontario's industrial base, and reductions in residential and commercial energy intensity. If conservation efforts were removed from the mix, the LTEP forecasts a 23 per cent increase in gross electricity demand between 2013 (149.9 TWh) and 2032 (184.3 TWh).

However, conservation is the focal point of the updated LTEP; it accounted for roughly 5 per cent of total electricity "produced" in 2013, and is forecast to reach 16 per cent by 2032 (see Section 2.3.4.1). The government expects to offset the majority (71 per cent) of the forecast growth in electricity demand to 2032 through conservation and energy efficiency programs, as well as improved codes and standards.

2.3.4.1 THE ROLE OF CONSERVATION IN ONTARIO'S FORECAST ELECTRICITY PRODUCTION

The 2013 Long-Term Energy Plan (LTEP) illustrates the per cent contribution of the different resources that will be used to meet Ontario's electricity needs. Confusingly however, this information is presented in two different ways in the LTEP. The differences in the two approaches are described below.

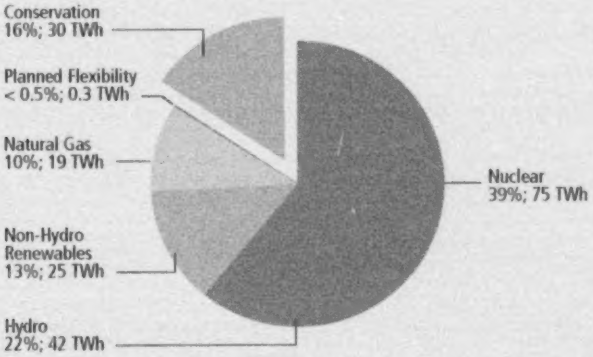


Figure 4: Gross Forecast Electricity Production - 2032

Figure 4 shows conservation as a form of electricity "production" that is equivalent to a terawatt-hour of generated electricity. In the Figure 4 scenario, total electricity production is equal to approximately 190 TWh – enough to meet Ontario's *gross* electricity demand forecast in 2032. By including the LTEP's 30 TWh conservation target in 2032 in the total amount of electricity "produced", the per cent contribution of other resources to total electricity production is reduced.

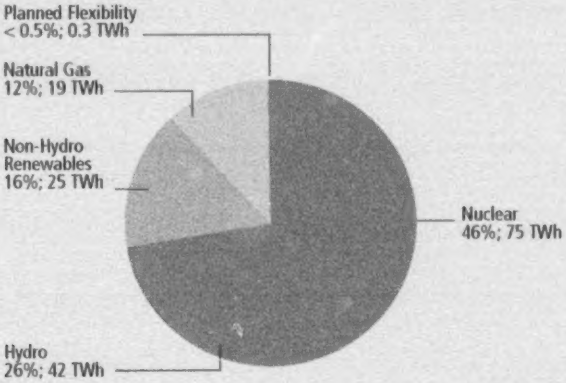
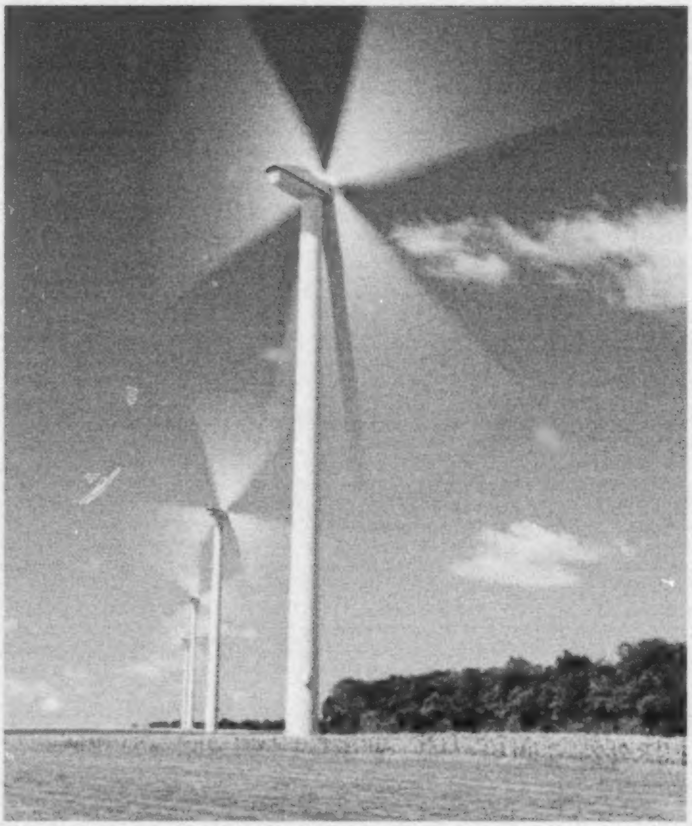


Figure 5: Net Forecast Electricity Production - 2032

Source: Ministry of Energy

When the impact of conservation is subtracted from the gross demand forecast, the result is net electricity demand – the amount of electricity that will need to be supplied by generators. This is shown in Figure 5, which presents the electricity production needed, by resource type, to supply Ontario's 2032 *net* electricity demand.

Throughout this section, per cent contributions to production include conservation.



Current estimates show that Ontario's planned supply mix will meet its needs up to 2018. However, some 400 to 3,600 MW of additional capacity may be required after 2018 due to nuclear refurbishment and retirement.[33] Over the LTEP planning period, specific commitments have not been made for supplying this additional capacity. This "uncommitted capacity" requirement may be met on an as-needed basis as resource requirements become apparent through "planned flexibility" (including clean imports; renegotiating expiring contracts with non-utility generators; and additional demand response and conservation).[34] Planned flexibility resources would be used very infrequently to meet peaks and deliver less than half of one per cent of Ontario electricity consumption, which could make them quite expensive per unit of electricity delivered. Additional conservation provides an opportunity to avoid the need for some of these resources.

The 2013 LTEP maintains a diversified supply mix (except that coal will be 'off the table' entirely after 2014). The Plan commits to adding more renewable generation, but at a more moderate pace with a slower build-out of non-hydro renewables than was targeted by the 2010 LTEP. Non-hydroelectric renewable energy sources, including wind, solar and bioenergy, are forecast to supply approximately 13 per cent of all electricity generated in 2032, up from 5 per cent in 2013.

2.3.5 MOVING TARGETS OF THE LONG-TERM ENERGY PLAN

Number of Conservation Targets Reduced

Despite conservation's central role in the 2013 LTEP, the Plan sets significantly fewer conservation targets compared to the 2010 LTEP. The 2013 Plan contains only one electricity consumption reduction target of 30 TWh in 2032, without any interim targets.[35] The target is equivalent to approximately 16 per cent of forecast gross electricity demand in 2032.

Table 2 illustrates the evolution of conservation targets contained in Ontario's last three provincial energy system frameworks – the Integrated Power System Plan (IPSP)-2007, and the two LTEPs (2010 and 2013). According to the Ministry of Energy,[36] targets contained in the 2013 LTEP supersede those in the 2010 LTEP.

Table 2: Evolution of Ontario's Demand and Consumption Reduction Targets 2007-2013

	Framework Targets					
	IPSP-2007		LTEP 2010		LTEP 2013	
Target Year	Peak Demand Reduction (MW)	Consumption Reduction (TWh)	Peak Demand Reduction (MW)	Consumption Reduction (TWh)	Peak Demand Reduction (MW)	Consumption Reduction (TWh)
2005	Base Year from which progress against targets is measured*					
2010	2,700	No Target				
2015	No Interim Target	No Target	4,550	13	No Interim Target	No Interim Target
2020	No Interim Target	No Target	5,840	21	No Interim Target	No Interim Target
2025	6,300	No Target	6,700	25	Use Demand Response to meet 10% of peak demand**	No Interim Target
2030			7,100	28	No Target	No Interim Target
2032					No Target	30

Source: Government of Ontario.

*With the exception of the 2025 Demand Response target.

**LTEP commits demand response to meet 10 per cent of forecast peak demand by 2025, or about 2,400 MW.[37] Conservation programs and energy efficiency codes and standards will also provide additional peak demand reduction, but do not have a specific target, so the peak demand reduction target in the LTEP 2013 cannot be directly compared with the peak demand reduction targets in previous plans.

No target = no target was set for the year within the framework timeframe.

No interim target = a long-term target was set within the framework timeframe, but no interim targets prior to the long-term target were set.

Changing the Approach to Peak Demand Reduction

Instead of an official megawatt peak demand reduction target, the ministry accounts for the expected contribution of conservation to reducing peak demand in two ways in the 2013 LTEP. First, the forecast gross peak demand is reduced to account for the expected impact of codes and standards, energy efficiency programs and time-of-use rates. Second, existing and new Demand Response resources will then deliver approximately 2,400 MW of peak savings (an amount equivalent to 10 per cent of the current net peak demand forecast in 2025).[38] This approach recognizes that Demand Response initiatives play a different role from traditional conservation programs; Demand Response resources specifically reduce peak demand and help balance supply and demand on a real-time basis.

New Demand Response resources will ramp up after 2020 to meet the 2025 target. Opportunities for new Demand Response resources to be developed under a market-based procurement will be led by the IESO. In its new role, the IESO will also transition Ontario's existing program-based Demand Response resources to a new market-based approach that offers Demand Response resources through mechanisms, such as an auction, as directed by the Minister of Energy in March 2014.[39]

The IESO has established a working group to discuss the role of Demand Response going forward and explore market-based opportunities to expand demand-side resources. It expects to transition existing Demand Response contracts beginning in the first quarter of 2015. With the exception of *peaksaver* PLUS, the OPA will not renew any Demand Response contracts beyond March 31, 2015, and will continue to manage existing Demand Response contracts to this time. Over the longer term, the IESO may also expand the opportunities available for expiring Demand Response contracts to participate in the market through a capacity market.

2.3.5.1 WHAT IS A CAPACITY MARKET?

As promised in the Long-Term Energy Plan, the Independent Electricity System Operator continues to examine the benefits and development of a capacity market to work in parallel with Ontario's existing electricity market. A capacity market is an auction-based process that identifies resources to meet a near-term peak demand projection. A forward auction is held for a specified period of time ahead of when the capacity is required (e.g., one to five years) to procure capacity resources (e.g., additional new generating stations or demand response capability) against forecast demand.

In the context of a capacity market, there is no functional difference between a megawatt of power from a power plant and a megawatt of reduced power from conservation or demand response. As such, a capacity market would technically allow supply-side (e.g., power plants) and demand-side (e.g., demand response, conservation, efficiency) resources to compete on a level footing to meet Ontario's future resource capacity needs.

In theory, a properly operating capacity market could be used to fill the anticipated "planned flexibility" supply gap without requiring the government to specify the type of resource that should be used. As such, demand-side (e.g., efficiency or Demand Response) or more traditional supply-side resources could fill the gap.

Renewable Generation – Targets Shifted Farther into the Future

By 2025, approximately 20,000 MW of electricity generation is expected to come from renewable energy. For non-hydroelectric renewables, the 2013 LTEP did not change the 2010 LTEP target amount (10,700 MW of installed capacity), but the target deadline was extended from 2018 to 2021. At the end of 2013, Ontario was a little over one-third of the way toward this target. The 2013 Plan did not set a new target for non-hydro renewable generation beyond 2021.

For hydroelectric generation, the 2013 LTEP moderately expanded the 2010 LTEP target – by 300 MW – to 9,300 MW of installed hydroelectric capacity by 2025. At the end of 2013, Ontario was on track to meet the 2010 LTEP target of 9,000 MW by 2018, with hydroelectric resources accounting for 8,388 MW of Ontario's installed capacity.

Competitive versus Fixed Price Renewable Generation Procurements

For large, small and micro renewable generation procurement, the 2013 LTEP reiterated changes made by direction from the Minister of Energy earlier in 2013.[40, 41]

A Feed-in Tariff (FIT) will be used to procure renewable generation projects up to and including 500 kilowatts (kW) in size through the FIT (> 10 kW to <= 500 kW) and microFIT (<=10 kW) programs. The Minister of Energy issued direction to the OPA containing procurement targets for each program (150 MW for FIT and 50 MW for microFIT) to be acquired between 2014 and the end of 2017. The targets are not technology specific. Unused capacity in any given year will be rolled over to the program's megawatt procurement target for the following year. In December 2013, the Ministry of Energy established a working group to discuss the feasibility of evolving the microFIT program to a net metering program beginning in 2018 to potentially increase the amount of distributed renewable generation connected to Ontario's electricity grid. Under a net metering program, electricity customers owning generation (e.g., solar panels) are charged only for the portion of their electricity use that is not offset by the amount of electricity that they generate.

Large renewable generation projects – greater than 500 kW in size – will not be paid a pre-determined set price as is done with the FIT programs. Instead, large projects will now be acquired through a competitive procurement process known as the Large Renewable Procurement program.

In addition to the FIT and Large Renewable Procurement programs, new hydro capacity will also be procured (at a pre-determined cap price, or less) through the Hydroelectric Standard Offer Program. Unallocated hydro capacity from these annual Standard Offer Program procurements will be made available to the Large Renewable Procurement program in the following year.

Different technologies and their respective capacity targets for Ontario's Large Renewable Procurement streams are shown in Table 3. Somewhat similar to the FIT and microFIT programs, uncontracted capacity from 2014 and 2015 (if any) will be reallocated to 2016.

Table 3: Targets for the Large Renewable Procurement Process

	Procurement Target (MW)			
Year	Wind	Solar	Bioenergy	Hydroelectric
2014	300	140	50	75*
2015	300	140	50	45**
2016	Any Large Renewable Procurement capacity that is not procured or delivered under existing contracts in 2014 and 2015 will be reallocated for procurement in 2016.***			

*Target includes 25 MW of capacity that was not allocated in 2013 from the Hydroelectric Standard Offer Program Municipal Stream procurement in addition to the 50 MW directed amount from the December 16, 2013 Direction.

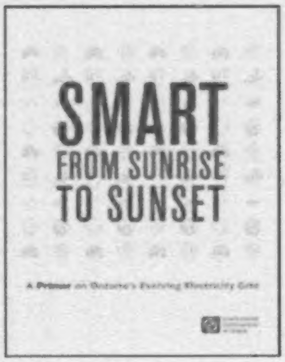
** The OPA shall transfer any unallocated capacity from the 2014 Hydroelectric Standard Offer Program Expansion Stream procurement (target of up to 40 MW) to the 2015 Large Renewable Procurement hydro target.

***Any hydro capacity resulting from the termination of Hydroelectric Standard Offer Program contracts up to December 31, 2015, shall be transferred to the 2016 Large Renewable Procurement hydro procurement target, along with any capacity from large renewable contracts that expire or terminate prior to 2016.

Source: Ontario Power Authority

Unless the government introduces additional renewable targets or supports net metering, the possibility exists that new renewable development will end once the current targets are reached (for non-hydro renewables in 2021 and hydro-electric generation in 2025). The government committed in the LTEP to review targets for wind, solar, bioenergy and hydroelectricity annually in the proposed Ontario Energy Report.[42] Much may depend on Ontario's supply-demand balance and on the price trends for renewables compared to other energy choices.

2.3.6 INNOVATIVE ELEMENTS OF THE 2013 LONG-TERM ENERGY PLAN



SMART
FROM SUNRISE
TO SUNSET

A Primer on Ontario's Evolving Electricity Grid

The 2013 LTEP established Ontario's first target for energy storage procurement – 50 MW by the end of 2014. Storage technologies have the potential to increase grid efficiency, better integrate renewable resources, increase system reliability and supply periods of peak demand to reduce the need for additional generators (see the ECO's smart grid report, *Smart From Sunrise to Sunset*). As of July 2014, the IESO had contracted 12 storage projects under this procurement, representing 33.5 MW of capacity. The OPA's storage procurement is delayed due to stakeholder feedback, and will be completed by mid-2015.

2.3.7 AREAS OF INACTION – OTHER LONG-TERM ENERGY PLAN PROVISIONS

Natural gas and transportation fuels jointly account for 69 per cent of Ontario's overall energy use (see Appendix A).[43] By comparison, electricity accounts for only 21 per cent of Ontario's energy use. Yet one element of the 2013 LTEP that remains unchanged from 2010 is the continued lack of conservation targets for fuels other than electricity – namely oil, propane and transportation fuels (natural gas targets are established by the Ontario Energy Board).

Unlike the previous LTEP, the 2013 version did introduce new policy relevant to natural gas and petroleum products. Specifically, it committed the government to pursue options to expand natural gas infrastructure to service more Ontario communities, and outlined the criteria that the government will use to evaluate proposals for oil and natural gas pipelines that will pass through Ontario, such as TransCanada's Energy East proposal. However, these policy commitments were made in isolation, without a broader multi-fuel analysis of how to best meet Ontario's energy needs.

2.3.8 ACCOUNTABILITY FOR PROGRESS ON TARGETS – THE ONTARIO ENERGY REPORT

The 2013 LTEP introduced a new government reporting requirement: the annual Ontario Energy Report. Few details were included in the LTEP, but in response to an ECO information request, the Ministry of Energy indicated that the report will actually be released on a quarterly rather than annual basis. The ministry has launched a working group with the OPA, IESO and OEB to scope and develop the report and expects it to be quantitative in nature, highlighting demand and supply conditions, as well as other key energy sector statistics that could include: cost breakdowns, conservation and emissions results.

The ministry indicated that it will seek feedback on the contents of the quarterly reports from stakeholders. And the OPA has developed an Ontario Energy Reporting webpage. The ministry did not indicate when the first quarterly report would be released.

In addition to the Ontario Energy Report, the Minister of Energy also directed OPA to continue to produce and publish an annual report on the overall progress toward achieving the 2013 LTEP conservation target.

2.3.9 ACCOUNTABILITY FOR PROVINCIAL ELECTRICITY SYSTEM PLANNING – WHO'S IN CHARGE?

Despite the new targets and commitments contained in the 2013 LTEP, its legal authority has yet to be established in legislation. Provincial electricity system planning in Ontario is supposed to be shaped by the detailed Integrated Power System Plan (IPSP) developed by the Ontario Power Authority (OPA) and required by current legislation.[44] The IPSP framework, which is still mandated under existing law, has three key legal requirements:

1. approval by the government as a whole (not just the Ministry of Energy) of the high-level goals that guide the plan (through a Supply Mix Directive authorizing the OPA to develop a detailed plan);
2. independent review of the OPA's plan by the OEB; and
3. authority for the OPA to act on its own initiative to ensure that the plan was achieved.[45]

In the 2010 LTEP, the government acknowledged its regulated commitment to prepare an IPSP,[46] but only met the first requirement of the IPSP framework through a Supply Mix Directive issued to the OPA in February 2011. The 2013 LTEP did not mention the IPSP and currently has not met any of the IPSP framework requirements. The Ministry of Energy has indicated that it does not intend to formally revoke the 2011 Supply Mix Directive or issue a new Supply Mix Directive.[47] Nonetheless, the targets and commitments contained in the 2013 LTEP are intended to supersede those contained in the 2011 Supply Mix Directive.[48]

Despite two attempts, the province has yet to approve a single IPSP. The LTEP has instead become Ontario's primary long-term energy system planning tool, and its implementation relies on the government following through on LTEP promises with specific actions, such as directives to energy agencies.

ECO Comment: Ontario's Long-Term Energy Plan

The 2013 LTEP provides a clear overview of the future policy directions for Ontario's electricity system. The ECO agrees with and commends the government's policy of conservation as a first resource, and looks forward to the development of many of the new conservation initiatives outlined in the 2013 LTEP. However, the proof of the government's commitment will lie in its ability to make conservation a daily function of utilities, agencies and the regulator. Since many of the LTEP's new conservation initiatives are still in the development phases, the ECO limits its comments to the following elements of the Plan: the continually changing nature of the conservation and peak demand targets; and the authority of the LTEP as a planning tool.

Moving the Goal Posts and Measuring Progress toward Targets

Unlike the 2010 LTEP, the new Plan is less prescriptive with respect to conservation targets. The 2013 LTEP does not contain any interim (peak or energy) reduction targets, and contains only a single long-term target for each of energy and peak savings. In this sense, the 2013 LTEP is the least prescriptive system plan with respect to conservation among Ontario's last three frameworks (i.e., the 2007 IPSP, the 2010 LTEP and the 2013 LTEP).

A less prescriptive approach may be beneficial. In principle, the ECO supports a nimble planning approach that makes regular course corrections to account for changing supply and demand conditions – as was done during the LTEP review. If used properly, this can help avoid overbuilding new supply that will burden ratepayers with higher costs for years to come. In the absence of short-term targets, a continued three-year LTEP update supported by up-to-date information from the Ontario Energy Report may be the right way to go.

However, it is troubling that all eight targets established by the 2010 LTEP were abandoned in the most recent iteration of the LTEP before the target years had been reached and the government (or the ECO) could provide a final report on them. Target changes made during LTEP updates should be supported by an analysis of the consequences (positive or negative) of these changes. For example, Ontario was not on track to meet its former, now cancelled, peak reduction targets contained in the 2010 LTEP (OPA data for 2013 show 79 per cent of the 2015 peak and energy reduction targets achieved with two years remaining). It is unclear whether Ontario residents are better or worse off than they would have been if these targets had been retained in the 2013 LTEP.

The ECO recommends that each update of the Long-Term Energy Plan explain the rationale for all target changes, including the consequences of altering, missing, exceeding or abandoning targets.

Only one consumption target is now in effect and the target year is 17 years away. When the government began its LTEP process in 2010, it committed to publishing a new LTEP every three years, and thus far it is on track. But, with forthcoming updates every three years, another six LTEPs could be published before the 2032 target year is reached. Considering that targets contained in Ontario's previous "long-term" system plans (the IPSP-2007 and 2010 LTEP) appear to be moving targets, vulnerable to being revised (in terms of amount or date) or abandoned with the release of each subsequent framework, the 2032 target essentially serves an aspirational function only. Will that be enough to drive action? A shorter-term 2020 target exists for utility conservation programs and will be subject to a mid-term review in 2018 (see Section 2.4); however, that is only one element that contributes to the LTEP conservation target. Action will be also needed on the Building Code, product standards, pricing policies and more.

Unless progress towards the LTEP target is somehow embedded in shorter-term organizational goals, it is unlikely that the government will be strongly motivated by a target that is 17 years away. In the absence of interim targets, the ECO is encouraged by the government's commitment to a new quarterly accounting initiative, the Ontario Energy Report. The Ontario Energy Reporting webpage will also track progress on conservation efforts in Ontario and currently lists a placeholder to report on "annual actual versus LTEP forecast of conservation."

The ECO believes that the commitment to report on progress against conservation targets provides an opportunity to correct a deficiency in the current reporting framework: namely, the OPA's estimates of energy savings from energy efficiency codes and standards. The 2013 LTEP's long-term conservation target was generated based on the results of OPA's achievable potential study, which indicated that approximately one-third of conservation savings in 2032 will be delivered by improved codes and standards (see Section 2.2.3).

In 2013, 20 per cent of reported savings toward the previous LTEP energy target were attributed to savings from codes and standards. Yet despite the significant contribution that codes and standards are expected to contribute to Ontario's conservation targets, the OPA appears to devote little or no resources to accurately quantifying these savings for specific code and standards. By contrast, the Canadian federal government produces and publishes forecasts of the energy savings associated with individual product efficiency standards.[49]

The ECO has previously cautioned against accepting the OPA's reported savings attributed to codes and standards at face value due to a lack of persuasive information that explains how these savings are calculated.[50] In the absence of accurate supporting information, it is difficult to see how codes and standards can be depended on to meet a significant share of Ontario's future electricity needs. To ensure accountability to the LTEP's long-term target, the ECO requests that further analyses of the savings from codes and standards, including savings attributed to specific code and standard updates, be provided in the Ontario Energy Report.

The ECO recommends that the Independent Electricity System Operator expand its scope of evaluation to measure and report energy savings from codes and standards.

A Little Matter of Accountability

Perhaps more important than the changing or abandoned targets, the extent to which the LTEP holds either the government or OPA accountable is also questionable. The LTEP has become the province's primary electricity system plan. Unfortunately, while the 2013 LTEP is big on conservation, with many promising initiatives to put conservation first, it is short on accountability.

The 2013 LTEP: adopted a lower demand growth forecast; slowed the build-out of renewable generation; deferred building new nuclear while authorizing refurbishment of existing reactors; and abandoned all conservation targets established in the 2010 LTEP. Yet, despite these substantial updates from the 2010 LTEP, the Ministry of Energy does not intend to issue a directive that would provide the legal authority to make these changes. Even without this legal authority, the Ministry still intends that the targets and commitments contained in the 2013 LTEP supersede those contained in the 2011 Directive. From an accountability perspective, the ECO finds this decision perplexing.

Moreover, while the government acknowledged its regulated commitment to prepare an IPSP in the 2010 LTEP,[51] it did not act on those commitments. Then, in the 2013 LTEP the government failed to even mention the IPSP, seeming to quietly abandon its regulated commitment altogether.

In 2012, the government proposed changes to the legal framework for electricity system planning. It introduced legislation (Bill 75, the *Ontario Electricity System Operator Act, 2012*) that would formally make the Ministry of Energy responsible for electricity system planning through an energy plan that would be approved by Cabinet. This bill was never passed.

One can debate whether or not the changes proposed in Bill 75 were an improvement. But the ECO believes strongly that what we have now – a law on the books that is ignored and has been replaced with an extra-legal approach under the sole purview of the Minister of Energy – is inadequate. It does not ensure that Ontario makes the best electricity system plan, nor does it provide accountability to ensure that the goals of the plan will be achieved. The government should either obey the existing law or amend the *Electricity Act, 1998* to establish a legal framework that would better meet those objectives.

2.4 THE NEW 2015 – 2020 FRAMEWORK FOR ELECTRICITY CONSERVATION PROGRAMS

2.4.1 INTRODUCTION

Ontario's Conservation and Demand Management (CDM) framework ended on December 31, 2014. To keep the province's conservation goals on track, Part Two of the *Conservation First* discussion paper focused on the development of a new framework to help local distribution companies (LDCs) and the Ontario Power Authority (OPA) deliver electricity conservation programs for the period 2015-2020.[52]

After seeking stakeholder and public input, the Minister of Energy issued three directives to establish the 2015-2020 Conservation First Framework (the "2015-2020 Framework"):

- In March 2014, the Minister directed the OEB to make it a condition of an electricity distributor's licence to make province-wide and/or local electricity conservation programs available to all customer groups (e.g., residential, commercial, industrial, low-income), where reasonable. The directive also requires the OEB to enable all cost-effective natural gas conservation, and put conservation first in electricity and natural gas distributor infrastructure planning processes.[53]
- Also in March 2014, the Minister directed the OPA to co-ordinate, support and fund the delivery of these conservation programs over the next six years to reduce total electricity consumption by 7 terawatt-hours (TWh) in 2020.[54]
- Six months after the first two directives were issued, the Minister issued a third directive, amending the March 2014 directive to the OPA and providing additional guidance on elements of the 2015-2020 Framework, including the calculation of payment incentives and inclusion of non-energy (environmental) benefits in the cost-benefit analyses of LDCs' conservation program plans.[55]

The technical details of the 2015-2020 Framework will be implemented through legal provisions of the Energy Conservation Agreement signed by the OPA and each LDC, which was presented to LDCs at the end of October 2014.

2.4.2 OUT WITH THE OLD AND IN WITH THE NEW

Many of the operational issues that hindered the success of the 2011-2014 Framework were identified in the *Conservation First* discussion paper, and the ECO has previously commented on many of them.[56] The *Conservation First* consultation emphasized the need for a fresh approach to LDC conservation programming in Ontario (Table 4).[57] Not surprisingly, the one-size-fits-all approach of the 2011-2014 Framework failed to accommodate the varied needs of Ontario's 70-plus LDCs. These LDCs differ widely in their capacities to deliver conservation programs, their customer characteristics, and even the regional climates of their delivery territories.

Table 4: Differences between the 2011-2014 Framework and the 2015-2020 Framework

"The Old" 2011-2014 Conservation and Demand Management Framework	"The New" 2015-2020 Conservation First Framework
Spanned a four-year period from 2011 to 2014, with no mid-term review.	Spans a six-year period from 2015 to 2020, with a mid-term review.
Contained two targets – energy conservation and peak demand reduction, which were allocated on an LDC's share of provincial electricity consumption.	Contains one energy conservation target allocated on regional electricity conservation potential and an LDC's share of residential and non-residential provincial electricity consumption.
Province-wide programs were designed by the Ontario Power Authority (OPA), with LDC input.	Province-wide programs are designed by an LDC working group, with final approval by the OPA.
Program cost-effectiveness calculation did not account for the non-energy benefits (e.g., environmental, economic and social benefits) of conservation.	Calculation of conservation program cost-effectiveness will include a 15 per cent adder to account for the environmental, economic and social (i.e., non-energy) benefits of conservation.
LDCs sought approval from the Ontario Energy Board (OEB) to deliver custom conservation programs.	The OPA reviews LDC proposals for custom programs. The OEB will not be responsible for program approval but will publish LDC program results annually.
A single performance incentive mechanism applied to both OPA programs and custom conservation programs. A distributor would begin receiving incentives per kilowatt and kilowatt-hour of savings achieved once it reached 80 per cent of both of its targets, up to 150 per cent of each target.	Two incentive mechanisms are available on a program-by-program basis, including Full Cost Recovery (similar to previous framework mechanism) and Pay for Performance. Under Full Cost Recovery, LDCs receive incentives for achieving or exceeding their final target and will also be eligible for a mid-term incentive payment if they are on track to meet their target at the Framework's halfway point.
Savings that resulted from time-of-use prices could count toward an LDC's peak demand Conservation and Demand Management (CDM) target.	The Minister of Energy's directive excluded activities related to the price of electricity from the definition of CDM. The directive expanded the definition of CDM to include "behind the meter" generation (on-site generators designed for a single building or facility that feed electricity directly to the facility without using the transmission or distribution system).[58]
The OPA-LDC relationship was guided by the 2011-2014 Framework's Master CDM Program Agreement. Changes to province-wide programs could be made through the agreement's program change management provision.	The OPA-LDC relationship will be guided by the 2015-2020 Framework's Energy Conservation Agreement. CDM Plan amendments can be made by an LDC or the OPA through consultation with each other.

2.4.3 GIVING LOCAL DISTRIBUTION COMPANIES THE LEAD

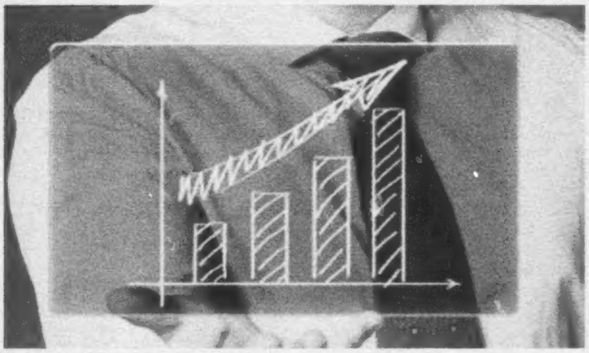
The 2015-2020 Framework gives LDCs the lead by granting them greater flexibility and autonomy to design and deliver programs tailored to their customers' needs. LDCs will be required to develop their own annual conservation plans, known as "CDM Plans." The CDM Plans can include a mix of LDC-designed province-wide programs, as well as programs suited to local and regional needs, provided they are cost-effective (with certain exceptions) and do not duplicate provincial programs.[59]

Similar to the 2011-2014 Framework, electric utilities must offer conservation programs and will be required by their licence conditions to make conservation programs available for all customer segments in their service areas (e.g., residential, low-income, commercial, industrial, Aboriginal). However, unlike the 2011-2014 Framework, it will no longer be a licence condition for LDCs to meet their electricity conservation target.

The OPA will support LDCs in the design of conservation programs through market, jurisdictional and emerging technology research, as well as data analysis, the sharing of best practices and cost-effectiveness modelling. The OPA will manage an Innovation Fund to test programs and refine program delivery at less risk to the ratepayer. The OPA will also offer program delivery services, if LDCs elect to use them.

2.4.4 A MORE AGGRESSIVE ENERGY TARGET AND BUDGET

The Target



The OPA and the Ministry of Energy relied on an achievable potential study and subsequent analysis to conclude that Ontario's LDCs could reasonably achieve 7 TWh of electricity savings in 2020 from conservation programs operating between January 1, 2015 and December 31, 2020 (see Section 2.2). Two-thirds of the savings are expected to come from programs that target the non-residential sector. LDCs will need to deliver an average of 1.2 TWh in incremental savings per year for each of the six years covered by the Framework to meet the target. For the period 2011-2013, distributors collectively delivered much more modest savings: an average of 0.55 TWh of annual incremental savings per year (see Table 7). This is approximately half of the average annual savings required to achieve the 2020 target.

The OPA allocated the provincial target among LDCs using a top-down approach – allocating the provincial target among LDCs based on their portion of total provincial demand – similar to the method used under the 2011-2014 Framework. However, the OPA also included additional steps to incorporate regional and sector-specific conservation potential:

- The target was first allocated on a regional basis according to the electricity savings potential identified by the achievable potential study for each of the ten Independent Electricity System Operator transmission system zones.
- The OPA then distributed each of the ten regional targets among the LDCs within each IESO zone according to an LDC's share of residential and non-residential consumption. This was done because the achievable potential study identified more conservation potential in the non-residential sector; without an adjustment, LDCs with predominantly residential customers would be at a disadvantage in meeting their targets.[60]

Unlike the 2011-2014 Framework, the 2015-2020 Framework does not include a peak demand reduction target for LDCs. Although the cost-effectiveness of programs that reduce peak demand should still encourage LDCs to pursue peak-saving programs, the major responsibility for peak demand reduction will fall to the IESO and OEB through market-based demand response and time-of-use pricing (see Section 2.3.5).

The Budget

The new six-year $2.2 billion conservation budget was derived by multiplying current conservation unit costs for energy efficiency programs by the new target amount.[61] Both the budget and the expected rate of energy savings are approximately double those set under the 2011-2014 Framework.

To align with target allocation, LDC budgets were based on each LDC's share of the provincial target by sector, multiplied by funding rates for the LDC's portion of residential and non-residential consumption. This provides LDCs with a total program budget for 2015-2020, which they can manage as they see appropriate to meet their target. However, to achieve their targets while staying on budget, it is likely that LDCs will have to focus more on the delivery of programs that target the non-residential sector (i.e., commercial and industrial) since these programs can typically be offered more cost-effectively.[62]

Electricity savings generated by the 2015-2020 Framework will reduce demand on the province's electricity system and help avoid the need for new electricity supply infrastructure. This is referred to as a "system benefit" – a reduction in the costs shared by all ratepayers, not just those who participate in specific conservation programs – because overall electricity production and delivery costs are reduced. The OPA expects the 2015-2020 Framework to deliver at least one billion dollars in net system benefits.

The OPA is required to update the achievable potential study by June 2016 and complete a mid-term review of the 2015-2020 Framework, as directed by the Minister of Energy, by June 1, 2018. Both of these activities could alter LDC targets, program budgets and the Framework itself.

2.4.5 THE CARROT AND THE STICK

An All or Nothing Approach to Performance Incentives

Utilities will be given financial incentives to meet part of, to meet all of, or to surpass their CDM targets. The Minister directed that LDCs be offered two types of performance incentives: "Full Cost Recovery" and "Pay for Performance." Distributors can opt for either incentive or a combination of both on a per program basis.

Under the Full Cost Recovery incentive mechanism, a tiered performance incentive based on final results at the end of 2020 will be paid to an LDC if it meets 100 per cent or more of its CDM target, up to a maximum amount above the target.[63] LDCs can also receive a mid-term incentive payment if they have achieved 50 per cent of their CDM target by December 31, 2017 (i.e., if they are on pace to achieve 100 per cent of their target by the end of 2020).[64]

Alternatively, the Pay for Performance mechanism could either be made in five annual increments, or as a single final payment. The payment(s) will be based on a dollar amount awarded per kilowatt-hour of verified savings. The Energy Conservation Agreement did not specify the rates that will be paid to LDCs under this mechanism; instead, Pay for Performance rates will be outlined in the "Program Rules" that will be released at a subsequent date. The Pay for Performance incentive structure should offer utilities higher potential rewards, but at greater risk (although the details of this performance incentive have not been finalized).

The Mild Consequences of Underperformance

If program savings are less than half of an LDC's annual milestone targets, the OPA can take action to attempt to improve LDC performance, although these actions do not have financial consequences for the LDC. However, if the LDC has also failed to offer programs cost-effectively, additional consequences apply to protect ratepayers, including the ability of the OPA to claw back funds from the LDC.[65] Based on the 2011-2014 Framework results, very few LDCs (if any) would fall below such a standard.[66]

Strong Incentives for Utility Collaboration

Collaborative conservation programs jointly provided by utilities can offer economies of scale and yield efficiencies that deliver energy savings at a lower cost to utilities and consumers. The 2015-2020 Framework will encourage utilities to collaborate on a geographic basis (e.g., electric utilities in the same regional planning zones) and to take advantage of similarities that may exist between electric and natural gas utilities (e.g., common customer types, opportunities and challenges).

As directed by the Minister of Energy, the OPA will provide significant incentives to utilities to collaborate on CDM programs. For example, LDCs that submit a Joint CDM Plan (i.e., one covering two or more distributors) will be eligible to increase their potential incentive payment by 50 per cent if they achieve their amalgamated target. The OPA will also aim to expedite its approval of Joint CDM Plans,[67] and offer additional revenue streams, such as a Collaboration Fund, to support collaborative programs.

2.4.6 ROLES AND RESPONSIBILITIES, PROGRAM APPROVAL AND REPORTING

The OPA will be the primary administrator of the 2015-2020 Framework. Among its responsibilities are: approving CDM Plans and budgets; tracking LDC progress toward targets; and awarding payments to LDCs. LDCs will be required to sign an Energy Conservation Agreement with the OPA that obligates them to submit their CDM Plan to the OPA by May 1, 2015.[68] The CDM Plans will set out the LDC's target, annual milestones, budget and CDM programs; the OPA has created a toolkit for LDCs that provides guidance on CDM Plan development. To ensure the timely approval of plans, the OPA's review can take no more than 60 days (per the Minister's direction).

Every year, the OPA will verify each LDC's annual, persisting and peak savings, funds spent and program cost-effectiveness using its Evaluation, Measurement and Verification protocols.[69] With the exception of low-income, First Nation and educational programs, all proposed CDM programs (local and provincial) must be cost-effective as determined by specified benefit-cost tests in order for an LDC to recover its full costs.

2.4.6.1 PUTTING A PRICE ON THE ENVIRONMENTAL, ECONOMIC AND SOCIAL BENEFITS OF CONSERVATION

In October 2014, the Minister of Energy provided additional guidance to the Ontario Power Authority for determining Conservation and Demand Management program cost-effectiveness. This guidance requires the OPA to account for the environmental, economic and social (i.e., "non-energy") benefits associated with CDM program savings under the 2015-2020 Framework. In lieu of precisely quantifying the non-energy benefits attained from electricity conservation (such as reduced greenhouse gas emissions), the Minister directed that future evaluation of program cost-effectiveness shall include a 15 per cent "adder," to increase the calculated benefits of conservation, based on the economic value of the energy saved. This fixed percent adder should enable more potential CDM programs to meet the cost-effectiveness requirement.

The OEB will play a less prominent role in the administration of the 2015-2020 Framework now that responsibility for approving custom CDM programs (referred to as regional or local programs under the 2015-2020 Framework) has shifted from the OEB to the OPA. As directed, the OEB will establish CDM "Requirement Guidelines" that will set out the Board's obligation to review and publish each LDC's verified program results annually and report the progress of LDCs in meeting their CDM requirements.[70] The Board will maintain responsibility for natural gas conservation and, in accordance with the Minister's directive, establish a Demand-Side Management (DSM) Framework for natural gas distributors that aligns with the electricity framework.

2.4.7 TIMELINE AND FRAMEWORK TRANSITION

The OPA plans to phase in new conservation programs. The OPA and LDCs have agreed upon a transition period that will extend most of the 2011-2014 programs until the end of 2015. The transition period will allow LDCs time to evolve their existing programs into the 2015-2020 Framework, as well as to launch some new programs in 2015. The goal is to create a seamless transition from the customers' point of view, with no gaps in the availability of conservation programs.

The OPA released the Energy Conservation Agreement on October 31, 2014, and expects to have signed agreements in place with all LDCs by January 1, 2015. Once LDCs have signed their agreement, they are required to submit their CDM Plans to the OPA by May 1, 2015. According to the OPA, any energy savings from programs acquired in 2015 will count toward the 2020 target, regardless of the framework under which they were initiated.[71]

ECO Comment

The 2015-2020 Framework has incorporated several lessons learned from the 2011-2014 Framework, giving LDCs greater flexibility to design custom programs that address their local needs and more potential to develop cost-effective programs. As LDCs develop their CDM Plans and file them with the OPA in early 2015, it will become more apparent whether the new Framework has led to major changes in the types of electricity conservation programs offered across Ontario. At this early stage in its development, the ECO limits comment on the 2015-2020 Framework to whether it provides LDCs with the adequate tools and incentives to meet the new conservation target.

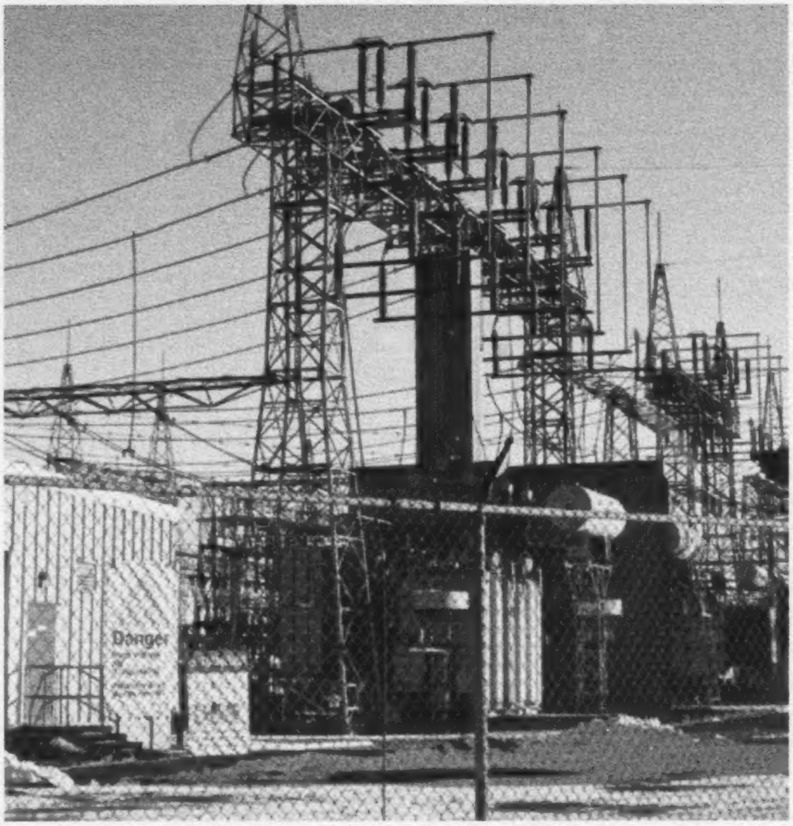
Can LDCs meet Ontario's more aggressive conservation target?

Overall, the ECO supports the simplified approach the 2015-2020 Framework has taken: LDCs are now the 'face of conservation,' tasked with a more aggressive target compared to the previous framework and without their focus divided by different energy and peak demand targets. Considering the magnitude of the target increase over current performance, LDCs will need to find deeper, more sustainable savings to meet the province's 2020 conservation goal.

The ECO commends the government for setting a more aggressive target and a larger budget to meet this target. However, the ECO cautions that target achievement relies on two key assumptions: (1) that the theoretical conservation potential identified in the achievable potential study can be translated into practical program achievements; and (2) that the cost to deliver a unit of conservation will remain unchanged as the amount of conservation increases.

The government has acknowledged LDC concerns about the accuracy of the achievable potential study. To address these concerns, the Energy Conservation Agreement requires the OPA to perform another achievable potential study by mid-2016 using a different methodology. This could lead to target adjustments. The OPA's budget development assumed that the unit costs of conservation will remain unchanged over the six-year period. This may also be invalid if the cost of conservation increases as LDCs reach for the potentially more expensive, 'higher hanging fruit.' While the OPA acknowledges this risk, it currently assumes the cost to generate savings will only begin to increase after 2020.[72] It is also possible that the cost trend may dip in the other direction. In fact, if LDCs and the OPA are able to develop programs that successfully deliver verifiable savings through low-cost operational or behavioural changes, then the average unit cost of conservation may stay unchanged or even decrease.[73] For these reasons, the ECO supports the Ministry of Energy's direction that the conservation budget should be assessed during the mid-term review of the 2015-2020 Framework.

The ministry's decision to include a 15 per cent adder to account for non-energy benefits in the calculation of conservation program cost-effectiveness is in line with best practices in other jurisdictions (e.g., Washington D.C. and Vermont, which use 10 and 15 per cent adders, respectively). This decision was made late in 2014, and the ECO was unable to assess whether 15 per cent is an appropriate amount or other details (e.g., the portion of the adder that is due to environmental benefits). The concept is laudable in any case, and the ECO commends the Ministry of Energy for taking steps to more fully assess the value of conservation and enable more potential CDM programs to meet the cost-effectiveness requirement. The ECO notes that the OEB rejected the need for an adder to incorporate the environmental impact of reduced natural gas consumption in 2011, and we encourage the Board to include such a policy in the guidelines for natural gas conservation that are currently under review and expected to align with this electricity conservation framework.



Do LDCs *need* to meet Ontario's new conservation target?

Although the 2015-2020 Framework provides LDCs with several new opportunities to reduce electricity consumption in their service territories, the ECO questions whether LDCs have enough incentive to aggressively pursue their targets. Given the uncertainty as to whether the new target – and the doubling in conservation performance that it requires – is achievable, the ECO questions the decision of the ministry and OPA to mandate a primarily 'all or nothing' incentive approach that only rewards 100 per cent achievement (of the mid-term and/or end-of-framework targets) under the Full Cost Recovery incentive mechanism. A graduated incentive system that begins at lower levels of achievement and provides increasingly greater rewards for higher achievement may have been a wiser choice.

The risk exists that LDCs, seeing no chance of meeting their targets, will not see any economic incentive to aggressively pursue conservation, and may do the bare minimum (i.e., make CDM programs available to all customer segments where reasonable, per their new licence condition). This risk may be increased, now that there is no mandatory OEB licence requirement to meet targets and little likelihood of financial penalties.[74] The mid-term review will provide an opportunity for LDCs and the OPA to re-evaluate elements of the 2015-2020 Framework's incentive structure, if progress toward the CDM target is lagging.

2.5 REGIONAL ENERGY PLANNING

2.5.1 INTRODUCTION

Grumpy Voters and Stymied Planners – Origin of the Planning Revisions

Most people pay attention to electricity planning only when they believe the process has failed them, usually as a result of a decision to locate a power plant or transmission towers nearby. Otherwise, people are content to treat planning as the specialized domain of experts equipped to resolve complicated technical problems.

In fact, the decisions are not that complicated. Planners have three basic choices: to conserve power; to build generating stations in growing communities; or to add transmission lines to bring power from distant sources. The real difficulty that planners face is devising a process that will engage the community, build consensus and reach a settlement. A broken planning process doesn't build consensus. Planning is the responsibility of several parties and occurs at three levels: a province-wide level for the entire provincial grid; a regional level (e.g., Sudbury-Algoma region); and the local level (i.e., at the level of the distribution utility, for example London Hydro).

Signs that Ontario's planning process was faltering at several levels have been evident for years. At the provincial level, despite attempts in 2007 and 2011, an Integrated Power System Plan (IPSP) that spells out specific additions to the province's power infrastructure has not been approved. Without a provincial plan in place, planning continued at the regional level on an *ad hoc* basis, with new power stations and transmission lines procured as needed.

Electricity plans could undergo an environmental assessment (EA), which also builds consensus. In the 1990s, the provincial-level plan (the Demand-Supply Planning Study) underwent an EA. In 2006, however, the province changed the environmental assessment process so that the IPSP was exempt from the *Environmental Assessment Act*. This effectively removed the public's ability to question the rationale of the entire plan or propose alternatives to particular infrastructure projects that it contained. Thus, the broad goals and direction of provincial-level planning do not benefit from public examination. In addition, although individual projects still require environmental approval, the EA process itself was changed in 2001 so that some classes of projects (e.g., certain electricity projects) do not undergo a full EA but are subject to a less rigorous screening process. Finally in 2009, the *Green Energy and Green Economy Act* streamlined environmental approvals for renewable energy projects and exempted them from certain *Planning Act* provisions that give municipalities planning control.

Inevitably, some citizens and local governments became dissatisfied with decisions to locate infrastructure in their communities. As examples, transmission lines in the western Greater Toronto Area, wind turbines in southwestern Ontario and offshore in the Great Lakes, and a generating station in York Region all drew local opposition. Then, in 2010 and 2011, the siting of two gas-fired plants became particularly controversial. The government cancelled construction of a gas plant slated for Oakville and stopped construction of another one in Mississauga. The Auditor General of Ontario and a committee of the legislature each began investigations into the cost of the cancellations. It is likely that the scheduled release of their reports in 2013 contributed to the development of a new power planning process that year.

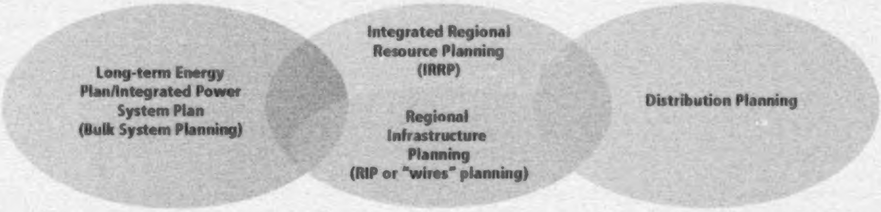
2.5.1.1 LEVELS OF ELECTRICITY PLANNING

Electricity planning has been done for many years, dating back to when Ontario Hydro and its predecessor, the Hydro-Electric Power Commission of Ontario, planned the electricity system in the last century. Today, electricity planning is the responsibility of several organizations and occurs at a provincial and regional level, as well as at the level of the local distribution system. Provincial level planning (see Section 2.3) gets most of the attention and ensures an adequate power supply for the province as a whole, but it does not necessarily guarantee that every community is efficiently served. The goal of regional and local planning is to meet the power needs of communities and to determine how this can best be accomplished. Solutions usually involve some combination of improved transmission and distribution, new generation and conservation. Each level – provincial, regional and local – overlaps with the others.

Planning at the provincial level is directed by the Ministry of Energy, led by the Ontario Power Authority (OPA) based on the ministry's direction, and typically has a horizon of about 20 years. As required by regulation, the approach includes the creation of a technically detailed Integrated Power System Plan (IPSP) developed by the OPA and approved by the Ontario Energy Board (OEB). The IPSP is a provincial level power plan with legal authority. There is a statutory obligation under the *Electricity Act, 1998* to produce an IPSP and it is binding on agencies and utilities once approved. Two IPSPs have been created, but neither has been approved or ever put into use.

In November 2010, the government released a Long-Term Energy Plan (LTEP) that is somewhat similar to the IPSP, although it contains much less detail and technical data. An updated LTEP was issued in late 2013 (Environmental Registry #011-9490). For the past few years, the LTEP process has replaced the IPSP and served as the provincial-level electricity plan. The LTEP, however, has no legal authority and does not bind the OPA, the Independent Electricity System Operator (IESO) or any other organization. The LTEP attains legal authority through the Minister of Energy issuing a Supply Mix Directive reflecting its terms. No such directive exists for the 2013 LTEP.

Planning at a regional level is led by either a transmission company or the OPA with the aid of transmission and distribution utilities. One of two types of plans is produced depending on the infrastructure proposed. When the OPA deems that an integrated resource solution is suitable (i.e., where generation or conservation are potential alternatives to wires), a regional resource plan considering all options is created by the OPA. When the OPA deems that only a wires solution is required, the transmission company operating in the region develops a plan which is then reviewed by the OEB. The planning horizon is typically medium-term (i.e., 5 to 10 years).


Long-term Energy Plan/Integrated Power System Plan (Bulk System Planning)
Integrated Regional Resource Planning (IRRP)
Regional Infrastructure Planning (RIP or "wires" planning)
Distribution Planning

Bulk System Planning
- 500 kilovolt (kV) & 230 kV transmission
- Interconnections
- Inter-area network transfer capability
- System reliability (security and adequacy) to meet applicable standards
- Congestion and system efficiency
- System supply and demand forecasts
- Incorporation of large generation
- Typically medium- and long-term focused

Regional Planning
- 230 kV & 115 kV transmission
- 115/ 230 kV autotransformers and associated switchyard facilities
- Customer connections
- Load supply stations
- Regional reliability (security and adequacy) to meet applicable standards
- Local area reliability criteria
- Regional/local area generation & CDM resources
- Typically near- & medium-term focused

Distribution Network Planning
- Transformer stations to connect to the transmission system
- Distribution network planning (e.g. new & modified distribution facilities)
- Distribution system reliability (capacity & security)
- Distribution connected generation & CDM resources
- LDC demand forecasts
- Near- & medium-term focused

Figure 6: Levels of Electricity Planning

At the distribution system level, plans are led by the relevant Local Distribution Company (LDC) for its service area. The horizon is near-term (5 or less years). Such infrastructure plans do not go through the regional planning process. Instead, projects proposed by LDCs are dealt with by the OEB in an LDC's rate application where it justifies the need of the proposed investment.[75]

This is the situation that planners faced when, for most of 2013, planning at a regional level came under review. A May 2013 report by the OEB introduced a formal framework for regional electricity planning, which until then had been done on an *ad hoc* basis. However, just before the Board released its report, the Minister of Energy asked the OPA and the IESO to jointly consult Ontarians on how to better engage local communities in planning and siting electricity infrastructure. In late summer, the OPA and IESO reported back. (The OPA-IESO and OEB reports are described in more detail below).

From the viewpoint of planners at the big power agencies (the OPA and IESO), there had been a lack of compromise and an unwillingness by communities to face realities. In the examples above, community emotions ran high; some voices were vehemently opposed to the local siting of any electricity infrastructure while, paradoxically, expecting to receive all the power they demanded. The government needed citizens to acknowledge this planning conundrum. So the revised approach proposed a process of enhanced engagement to help communities accept the cause-and-effect nature of their decisions. Responsibility for decisions would be placed on a community in return for improving local influence over the choices. The implied message from planners was twofold. First, municipalities must acknowledge that electricity is essential to their functioning. A link exists between power demand and local development. Second, accepting this premise, communities must be accountable for decisions – whether for or against – on locating infrastructure within their boundaries. Communities that reject infrastructure must conserve electricity or limit their growth or find some other solution.

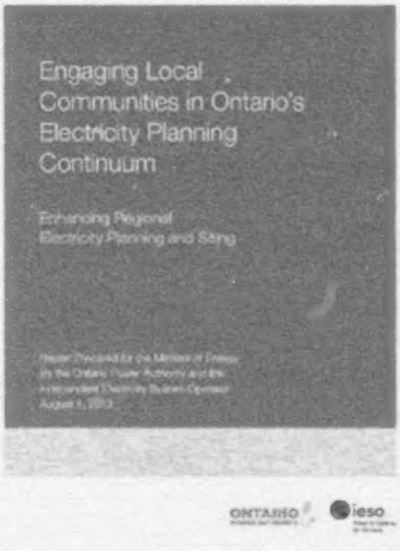
This section of our report examines regional electricity planning policies and recommendations in reports produced by the OEB and OPA-IESO, with a focus on the following questions:

1. Are there adequate linkages between regional planning and other levels of electricity planning?
2. Is conservation placed on an equal footing with generation and "wires" solutions when examining alternatives for meeting regional electricity needs?
3. Are there adequate mechanisms for public input?

2.5.2 A FLURRY OF ANNOUNCEMENTS AND REPORTS

Government Announcements

In early May 2013, the government announced that it would strengthen energy planning, and the Minister of Energy requested that the OPA and IESO consult and develop recommendations for a new regional planning process that would site energy infrastructure in a manner that respected communities' views.[76] Engaging local communities and selecting the right location from the beginning were key concerns.[77] Following rapid consultation, a new approach was hastily unveiled.[78] In August, the agencies delivered a joint OPA-IESO report – *Engaging Local Communities in Ontario's Electricity Planning Continuum* – containing 18 recommendations. After reviewing the report, the government announced that "it [would] adopt all of the recommendations."[79] The details and implications of this key report are laid out in this section.



Engaging Local Communities in Ontario's Electricity Planning Continuum

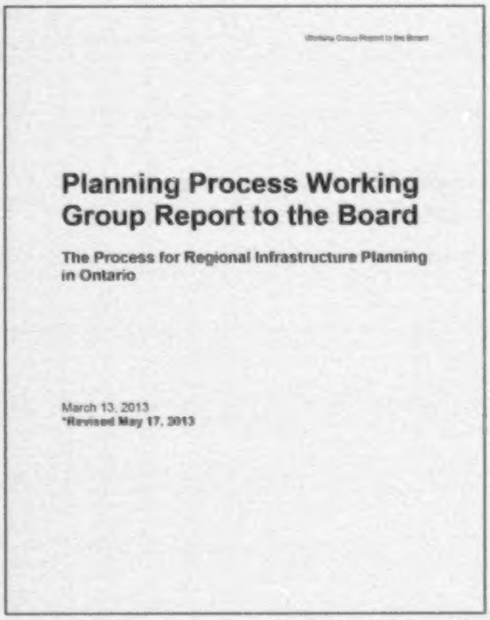
Enhancing Regional Electricity Planning and Siting

In late May 2013, the minister made another announcement, stating the government would work with communities to increase local control over renewable energy projects.[80] The province's feed-in tariff (FIT) will play a much smaller role in procurement; for large renewable generating stations of 500 kilowatts or greater, the FIT process has been replaced with a competitive tendering method called the Large Renewable Procurement process. The announcement underscored that planners and developers would be required to work directly with municipalities to identify appropriate locations and site requirements, and the process would prioritize projects led by municipalities or those with which they were partners. [81]

Throughout the remainder of 2013, the government repeated in four further announcements that it had received and was acting upon the OPA-IESO report to improve electricity planning.[82]

The Reports

Ontario Energy Board Report



Planning Process Working Group Report to the Board

The Process for Regional Infrastructure Planning in Ontario

March 13, 2013
*Revised May 17, 2013

For reasons of regulatory efficiency, the OEB had begun an overhaul of electricity planning in 2010 as part of a comprehensive review of electricity policy. Five hearings, grouped as a Renewed Regulatory Framework for Electricity Distributors, focused on the investments and financial performance of LDCs.[83] One hearing (EB-2011-0043) resulted in the creation of a process to enhance co-ordinated planning and integrate regional issues when transmission infrastructure is built. In May 2013, the OEB released a report, *The Process for Regional Infrastructure Planning in Ontario*.[84] It laid out conditions and procedures which utilities must follow in requesting Board approval of investments contained in a Regional Infrastructure Plan (RIP).

The RIP process is important because it is a legally defined process, endorsed by the Board and given authority through OEB codes and licence conditions. It replaces and formalizes previous planning carried out by the OPA and utilities on an as-needed basis. It serves as a sort of 'bedrock' process on which the OPA-IESO's developing Integrated Regional Resource Planning process (IRRP) is situated and with which it interacts. Amendments were made to the OPA's licence in October 2013 to reflect the OPA's legal obligations in regional infrastructure planning. These were minor compliance matters, such as the timeline (18 months) for completion of an IRRP and its provision to utilities and municipalities in the region. Weightier issues, such as the degree of stakeholder engagement and how to evaluate planning options, are still evolving and are not licence conditions. The two processes, RIP and IRRP (see Section 2.5.2.1), together provide a formalized more comprehensive approach to planning. Ideally, they eventually will be integrated with provincial and local electricity planning.

2.5.2.1 HOW THE PLANNING PROCESSES WORK – RIPs AND IRRPs

There are two key points of contrast between the Regional Infrastructure Plan (RIP) and the Integrated Regional Resource Plan (IRRP) processes: (1) the type of solutions each contains (transmission, generation and conservation); and (2) the opportunities for public consultation.

A transmission company must create a RIP. The RIP process considers solely "wires" for delivery of electricity, and excludes any other alternative solutions, like conservation or generation (unlike the Ontario Power Authority's broader IRRP process).

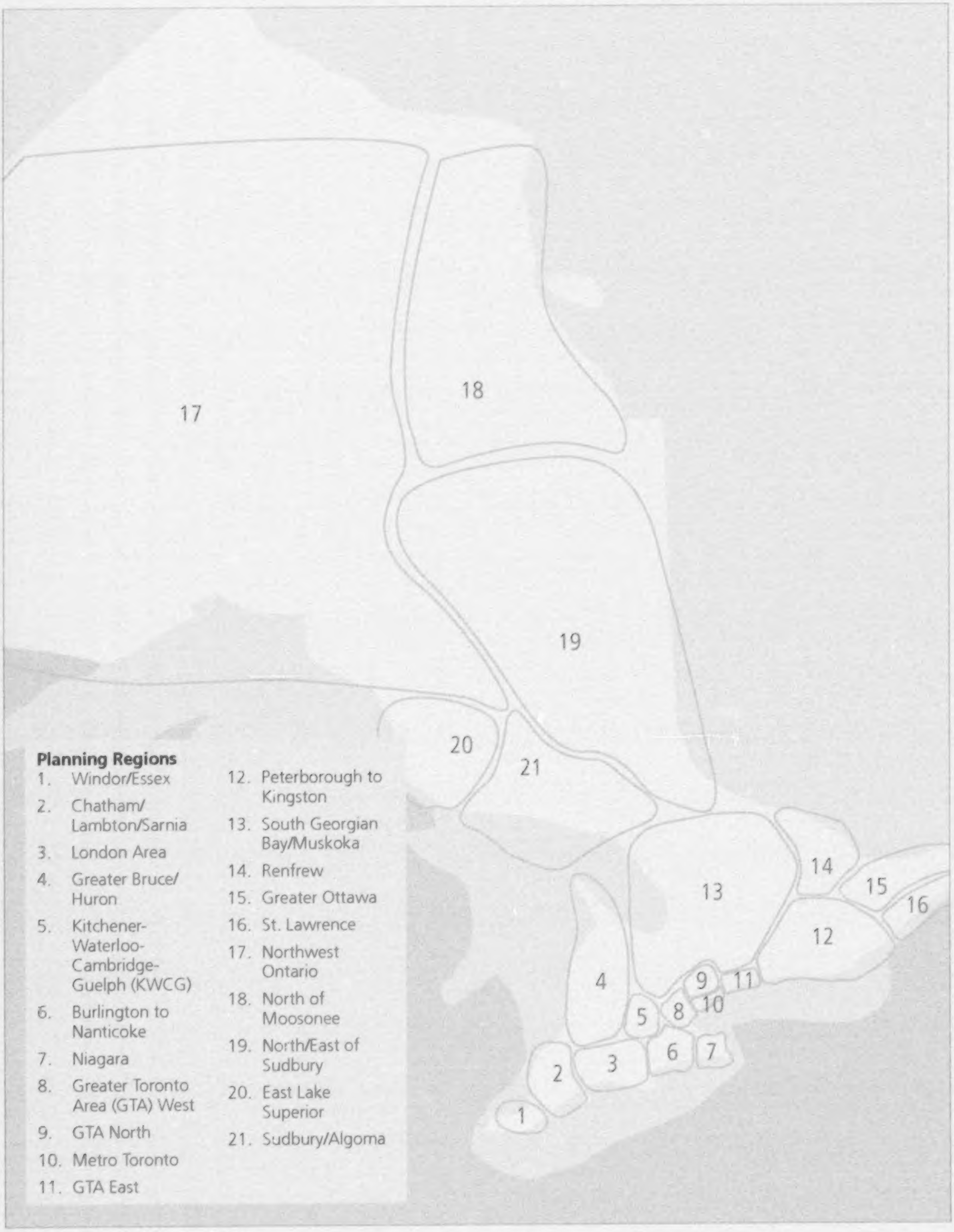
In the regional planning process, regional plans (RIPs or IRRPs) are developed on a regular schedule in 21 regions adapted from Independent Electricity System Operator zones and Local Distribution Company boundaries. A plan is triggered by its scheduled five-year review or an urgent circumstance (e.g., a ministerial directive or forecasted need). The transmitter usually identifies the trigger to initiate planning, but other parties (such as LDCs and the IESO) can also alert the transmitter to a trigger. The trigger is typically growing demand or operational constraints on the grid.

The transmission company performs a Needs Screening to determine whether to undertake regional planning. A decision point occurs here. If the need can be resolved at the level of the local distributor's boundaries and is not regional, no regional plan is needed. The infrastructure investments could be submitted directly to the Ontario Energy Board for approval, as part of a rate or facilities application.

If the problem is determined to be regional in nature, the next step is to scope whether an RIP or the Ontario Power Authority's broader IRRP is the suitable solution.[85] The Ontario Power Authority reviews information from the transmitter's Needs Screening. The Ontario Power Authority conducts a scoping assessment to confirm if a wires-only solution (RIP) is in fact appropriate. Public engagement occurs at this scoping point and is relatively brief.[86] A decision point occurs here.

If a wires solution fits, the RIP proceeds and specific wires options are examined. The Ontario Energy Board then uses the RIP in a leave-to-construct or a rate application. Pubic engagement will also occur at this point (but not on options, only on the wires project's technical details).

If the scoping exercise determines that the alternative IRRP is more fitting, the Ontario Power Authority initiates an IRRP process to compare the broader resource solutions, including conservation, generation and transmission.[87] The IRRP options are examined through public consultation on the scoping report and further consultation later in the process through community participation in the development of the IRRP.[88]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Planning Regions
1. Windor/Essex
2. Chatham/ Lambton/Sarnia
3. London Area
4. Greater Bruce/ Huron
5. Kitchener-Waterloo-Cambridge-Guelph (KWCG)
6. Burlington to Nanticoke
7. Niagara
8. Greater Toronto Area (GTA) West
9. GTA North
10. Metro Toronto
11. GTA East
12. Peterborough to Kingston
13. South Georgian Bay/Muskoka
14. Renfrew
15. Greater Ottawa
16. St. Lawrence
17. Northwest Ontario
18. North of Moosonee
19. North/East of Sudbury
20. East Lake Superior
21. Sudbury/Algoma

Figure 7: Ontario's Electricity Planning Regions and Process

The OPA-IESO Report

The OPA and IESO interpreted the Minister's direction of May 2013 as a threefold task: (1) document detailed procedures on how to develop plans; (2) develop transparent input mechanisms for stakeholders, particularly municipalities; and (3) reflect recommendations of the Standing Committee on Justice Policy on siting of large infrastructure projects.[89]

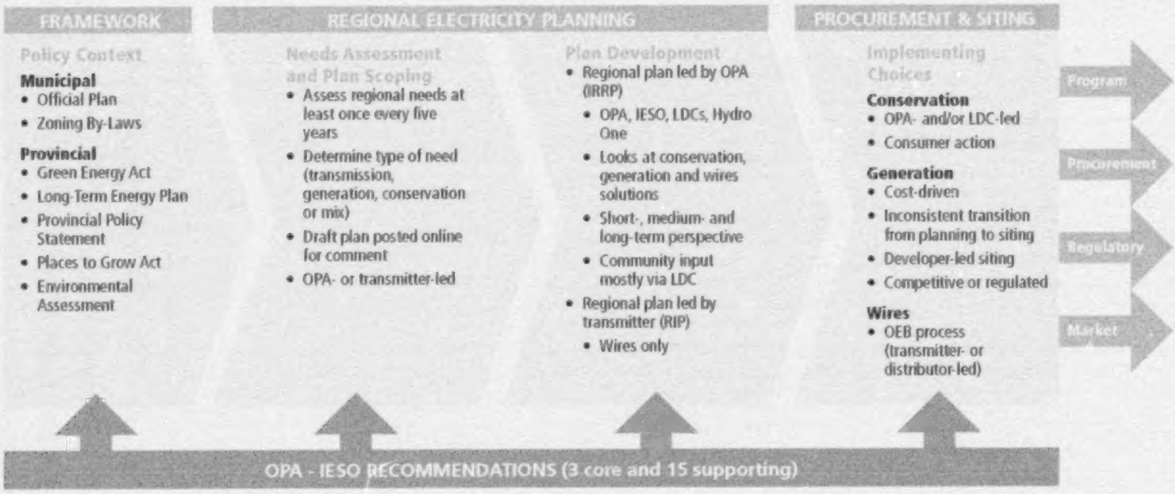

FRAMEWORK
REGIONAL ELECTRICITY PLANNING
PROCUREMENT & SITING
Policy Context
Municipal
• Official Plan
• Zoning By-Laws
Provincial
• Green Energy Act
• Long-Term Energy Plan
• Provincial Policy Statement
• Places to Grow Act
• Environmental Assessment
Needs Assessment and Plan Scoping
• Assess regional needs at least once every five years
• Determine type of need (transmission, generation, conservation or mix)
• Draft plan posted online for comment
• OPA- or transmitter-led
Plan Development
• Regional plan led by OPA (IRRP)
• OPA, IESO, LDCs, Hydro One
• Looks at conservation, generation and wires solutions
• Short-, medium- and long-term perspective
• Community input mostly via LDC
• Regional plan led by transmitter (RIP)
• Wires only
Implementing Choices
Conservation
• OPA- and/or LDC-led
• Consumer action
Generation
• Cost-driven
• Inconsistent transition from planning to siting
• Developer-led siting
• Competitive or regulated
Wires
• OEB process (transmitter- or distributor-led)
Program
Procurement
Regulatory
Market
OPA - IESO RECOMMENDATIONS (3 core and 15 supporting)

Figure 8: The Context of Planning

The OPA-IESO report concluded that improving the regional planning process was a matter of refinement, not reinvention, stating that "the OPA's current regional electricity planning process provides a sound foundation for meeting the Minister's – and the communities' – objectives," and maintained that it would provide an appropriate bridge from broader planning through to siting of facilities. [90] The report included three core recommendations – strengthen outreach, improve local influence, and co-ordinate ministries – that apply to all aspects of the planning process. Fifteen supporting recommendations, targeting specific process tasks, were mapped onto the RIP-IRRP processes to show how to improve regional planning.

According to the report, regional planning is a *continuum* – a connected sequential process made up of multiple tasks, including: preparing a needs assessment, scoping a solution appropriate to needs, consulting, drafting the plan, getting community agreement, and implementation. Regional planning operates within a governance framework, which includes policies (e.g., municipal Official Plans), provincial legislation (e.g., the *Green Energy Act, 2009;* the *Places to Grow Act, 2005;* and *the Environmental Assessment Act*), and other instruments (e.g., the Provincial Policy Statement, Long-Term Energy Plan and the Greenbelt Plan).

To better integrate planning with the governance framework, the OPA-IESO report recommended that electricity needs need to be integrated into municipal plans. Some mechanisms proposed were:

- modify the Provincial Policy Statement to require municipalities to consider electricity needs in their municipal Official Plans;
- integrate planning approvals under the *Environmental Assessment Act* and *Planning Act*, including the requirement that the approval be consistent with the policies of the Provincial Policy Statement;
- insert a warning on the title of lots that are in proximity to existing or potential electricity facilities, and make this a condition of approval of subdivision or site plans; and
- amend O. Reg. 543/06 under the *Planning Act* to enable the OPA or IESO to receive notice and a copy of proposed official plans or plan amendments.

The report also recommended strengthening transparency during plan implementation by reviewing the use of the following mechanisms related to planning and procurement:

- the role of the IPSP;
- an "outcomes-based" supply mix directive; and
- linkages between the various levels (provincial, regional and local) of electricity planning.

Strengthening feedback loops and increasing access to information were the key means suggested to ensure local input. The OPA-IESO report also recommended establishment of new advisory committees to: add broad representation (e.g., elected officials, community representatives, and business interests); provide input on local priorities; and assess proposed options. A member of this new committee will also participate in any project's technical planning group, and the committee will help the OPA and utilities develop an engagement strategy based on best practices, including environmental assessment and other processes.

The report recommended new opportunities, including funding, to support community energy planning and to assist municipalities in assuming responsibility. Eight municipalities were funded in 2014 by a program delivered by the Ministry of Energy;[91] a primer on how to develop community energy plans was also funded.[92]

The OPA-IESO report examined the situation where a power generation solution is sought and siting a large power plant becomes necessary.[93] In these cases, the OPA uses a procurement process – either a competitive Request for Proposals or a standard offer program (set contract terms and price). Generally, the project proponent identifies the site. There are siting process requirements designed to ensure community engagement. The OPA evaluates Request for Proposal projects based on mandatory criteria, including: the conduct of community outreach to identify concerns; the amount of local support; and compliance with municipal plans and by-laws. Standard offer procurements are assessed based on another set of criteria, such as the type of applicant (e.g., municipality, community group) and degree of local support. Successful applicants would, as a condition of their contract, be responsible for completing provincial environmental approvals, as well as local approvals (e.g., permits and licences).

The OPA-IESO report did not make recommendations with respect to siting, but referenced practices from other jurisdictions, such as a multi-stage selection process, a siting board, and the funding of social and employment programs in willing host communities. It also included feedback from public consultation on the report, as well as input to Standing Committee on Justice Policy proceedings that included some process suggestions:

- develop a protocol for community energy plans so these plans will be taken as credible inputs by provincial electricity planners;
- create mandatory siting guidelines for gas-fired generators that include environmental, health and safety criteria; and
- formally incorporate municipal Official Plans into the planning and siting process.

The report recommended considering broader criteria, such as local concerns and priorities, when procuring generation. It also recommended that planning recognizes broader societal goals by factoring in social and environmental benefits and expanding planning beyond a least-cost approach. The report acknowledged this would require a decision on cost allocation by the government or the OEB.

The OPA-IESO report advised the Minister that it would further consult ministries, agencies, associations and others on its recommendations, and would report back with an update on detailed implementation activities. This update report was delivered in September 2013, and briefly set out the OPA's efforts to improve transparency and access to data. Regional planning websites for each of the nine locales currently developing regional plans have been created.

According to the September update report, recommendations that are the responsibility of the OPA or IESO were being immediately incorporated into their work. Recommendations that are the responsibility of the government were being implemented, in part through meetings with ministries. The OPA and the Ministry of Energy met with staff from the Ministry of Municipal Affairs and Housing and the Ministry of the Environment and Climate Change in late 2013 and in 2014 and discussions are ongoing. Actions that the

OPA and Ministry of Energy deemed completed were: a review of the Provincial Policy Statement to reflect electricity requirements; the Ministry of Energy's participation in the co-ordinated review of provincial plans (e.g. the Growth Plan for the Greater Golden Horseshoe); and the creation of an energy committee made up of ministries and the Association of Municipalities of Ontario.

Further work was needed to address environmental issues earlier in the procurement process. Also, the Ministry of Energy is required to develop a guide to help municipalities implement the new Provincial Policy Statement and work has begun on information material. The OPA-IESO report recommended that a ministry action team – with representatives from several ministries – be created to co-ordinate policy and clarify accountability. The ministries decided to raise regional planning issues at existing committees rather than establish a new inter-ministerial team.

2.5.2.2 NEXT STEPS IN REGIONAL PLANNING

During the next five years, the Ontario Power Authority (OPA) has promised an assessment of the need for regional plans in all 21 electricity regions. Nine such plans are already underway in the following regions: Burlington to Nanticoke, Greater Ottawa, Greater Toronto Area (GTA) North, GTA East, GTA West, Metro Toronto, Kitchener-Waterloo-Cambridge-Guelph (KWCG), Windsor-Essex and Northwest Ontario. KWCG's IRRP proceeded first and will be a test case for the new process's ability to incorporate local views and strike a balance between transmission, conservation and distributed generation solutions. Public consultation for Toronto's IRRP began in September 2014. A draft scoping assessment outcome report was issued for public comment for the GTA East region in November 2014; it recommended that the next step in regional planning for GTA East would be an OPA-led IRRP.

What the Planning Review Did Not Address

To add perspective on all this electricity planning, it helps to itemize what the government and its agencies did *not* envisage as part of the planning review.

The government did not require the agencies to examine multi-fuel planning and did not extend the review beyond electricity. Despite news releases and the Minister's direction that boldly asserted the government's strengthening of *energy* planning and securing Ontario's *energy* future,[94] the Ministry of Energy confined its framing of energy policy to just electricity.

The review of regional planning – even one restricted to electricity – did not attempt to incorporate other electricity planning frameworks, currently used in Ontario, in order to design truly comprehensive power system planning. When launching the regional planning review, the processes for approving renewable generation (e.g., microFIT, the feed-in tariff and the Large Renewable Procurement framework) were not integrated into the regional planning review. In addition, smart grid planning was not incorporated; a 2010 government Directive mandating the OEB with regional co-ordination of smart grid planning existed but was not included in the regional review.

The OPA-IESO report gave no indication how these separate processes will be co-ordinated with regional planning. The OEB report stated that it was premature to establish regional smart grid planning since the region boundaries and, hence, the basis for smart grid planning at the distribution level is undetermined. However, the report allowed that a regional process offered opportunities to co-operate and co-ordinate development of the smart grid, particularly where conservation was the preferred solution of a regional plan and the smart grid facilitated this conservation.

The government, clearly, did not intend a rethink of regional energy planning that started with a clean slate and addressed issues related to planning the energy grid (i.e., multi-fuel). Nor did the government intend a complete overhaul of electricity planning or even regional electricity planning. Instead, it expected a focused examination of how to optimize participation by municipalities, First Nations and other communities, with the goal of improving siting decisions or, at least, avoiding a repeat of the gas plant debacles.

2.5.2.3 HOW ENVIRONMENTAL APPROVAL OF ELECTRICITY PROJECTS WORKS

During implementation of a regional electricity plan, project proponents are responsible for completing provincial environmental approvals as part of site selection. The Ontario Power Authority, Independent Electricity System Operator, and Ontario Energy Board do not have authority to review or approve environmental permitting issues related to electricity infrastructure; that is the purview of the Ministry of the Environment and Climate Change and the Ministry of Natural Resources and Forestry.

Hydropower, natural gas, wind, bio-energy and solar electricity generation projects are subject to different types of environmental approvals which are also applied differently depending on project size. Transmission lines may undergo a Class Environmental Assessment under Ontario's *Environmental Assessment Act*. There may also be federal environmental approvals (e.g., for nuclear stations, extra-provincial transmission). To consider just the provincial environmental approvals for power plants: the major distinction is between renewable and non-renewable generators.

Proponents of non-renewable generation projects must obtain an environmental assessment (EA) approval following the requirements set out in the *Environmental Assessment Act* and its accompanying regulations. The specific assessment process depends on the technology, fuel type and generator size. An Individual EA is the most rigorous process; it entails the fullest examination of issues, extensive consultation and a consideration of alternative solutions and sites. Generally, the Individual EA process has applied only to large, complex projects with a high profile and significant environmental impact (e.g., hydroelectric stations over 200 MW).

O. Reg. 116/01 (Electricity Projects) made under the *Environmental Assessment Act* created a streamlined process to be used in place of an Individual EA. Instead of an individual EA, most proponents of large-scalle generation projects (e.g., natural gas-fired stations that are 5 MW or larger) need only follow an Environmental Screening Process and assess a project against a checklist of criteria. This typically includes public consultation, examination of site-specific impacts (e.g., wildlife habitats, air quality) and development of mitigation measures. The screening does not require an assessment of alternatives (i.e., alternative methods to achieve the purpose of the project or alternative sites). The screening has a provision for citizens to request that the Minister of the Environment and Climate Change elevate the project to an Environmental Review Report or an Individual EA, although such requests usually have not been granted.

Renewable energy projects, except for water power projects which are subject to the Class EA process described above, are not subject to *Environmental Assessment Act* requirements. Proponents must obtain a Renewable Energy Approval, as set out in O. Reg. 359/09 made under the *Environmental Protection Act, 1990*. Most large renewable energy projects (e.g., wind, ground mounted solar) must obtain a Renewable Energy Approval before construction. It includes consultation and a site-specific assessment of environmental impacts and proposed mitigation. A Renewable Energy Approval is either approved, approved with conditions or denied, and can be appealed to the Environmental Review Tribunal.

The renewable energy procurement process was changed by Minister of Energy's direction in December 2013 when the feed-in tariff for large projects was ended and the OPA was instructed to replace it with a Large Renewable Procurement process. Under the new Large Renewable Procurement community engagement rules, the project proponent must mitigate project impacts, as agreed to with the local municipality, and satisfy the requirements of other regulations including environmental and municipal approvals. [95]

The Ministry of the Environment and Climate Change allows proponents of small ground-mounted solar systems (O. Reg. 350/12), and is considering allowing other small-scale renewable generation projects (i.e., on-farm bio-digesters and turbines using land-fill gas), to register their projects on the Environmental Activity and Sector Registry without having to obtain other environmental approvals (Environmental Registry #011-5695 and #011-8592). Registry criteria for such facilities are designed to eliminate potential environmental impacts through facility design, pollution control technology and siting restrictions.

ECO Comment

Since the revised planning and siting framework is still evolving and has only begun to be tested in practice, the ECO limits commentary to two matters: (1) the extent to which conservation will, in fact, be put 'first' in regional plans; and (2) whether a revamped environmental approvals process could assist the goal of strengthening local engagement and input.

Will Regional Planning Put Conservation First?

Are Links Between Provincial and Regional Planning Adequate to Safeguard Conservation?
There is an obvious need to clarify the linkages of regional plans to the provincial electricity plan and to determine which of these plans takes precedence.[96] Consider recommendation 11 of the OPA-IESO report, which states that system planning and related infrastructure should include broader social and environmental goals, while recognizing local interests. It is not clear to the ECO if and how the IRRP process could resolve a situation where the community does not accept a major recommendation of an IRRP. For example, what happens if the IRRP recommends a generating plant and the local advisory committee favours a conservation solution?

Clarification is required on two issues. First, to improve accountability, the government must provide a legally binding provincial-level energy plan. It must describe the roles played by the IPSP (the LTEP is much less relevant since it is a policy document with no legal authority) and the Minister's directive power in the IRRP process. And second, the government must explain how regional plans will operationalize conservation and put the LTEP's Conservation First mandate into practice.

The OPA-IESO report noted that the current planning and procurement approach includes an IPSP and recommended a review of planning and procurement mechanisms, such as: the role of the IPSP; the Supply Mix Directive; and the linkages between provincial, regional, LDC plans and municipal plans. Neither the Ministry of Energy nor the OPA answered an ECO enquiry whether the recommendation to review the role of the IPSP and the Supply Mix Directive in relation to planning and procurement is being undertaken. However, both organizations responded that regional plans will promote Conservation First.[97]

The ECO urges the Ministry of Energy to clarify the role of the IPSP, explain how conservation is integrated between provincial and regional plans, and identify who is accountable. The ECO suggests the government take the following steps to operationalize Conservation First:

- Issue a supply mix directive or legislative amendment to create a legally binding "loading order" for the sequence of planning options in which electricity demand is met (e.g., energy efficiency as the first preferred option, followed by renewable generation, clean distributed generation, etc.).
- Issue direction to the OPA on how to implement Conservation First in the IRRP's Scoping Assessment Outcome Report.
- Issue a set of protocols to guide agencies when local advisory committee preferences conflict with other planning options.

Are Links Between Regional and Distributor Planning Adequate to Safeguard Conservation?
Although the Conservation First Framework is still under development and the integration of conservation into regional plans is still evolving, the linkage of regional plans to local-level LDC conservation plans is more obvious. In addition, the ECO sees movement to incorporate conservation in regional plans through distributor-level CDM plans. This is cause for cautious optimism.

LDCs will develop local peak demand forecasts and forecasts of the contribution of energy efficiency; the projected electricity savings can inform regional plans. LDCs are also required to develop CDM plans as part of the 2015-2020 Conservation First Framework (see Section 2.4). The OPA has created a tool kit with rules, guidelines and resources for implementing the framework, including how to incorporate conservation in regional plans. Regional tools – energy efficiency, demand response and achievable potential calculators – are available for LDCs to use to design programs included in their CDM plans, which should help align the CDM Plans with IRRPs.

Some of the terms of the Conservation First Framework enable LDCs to better deploy conservation into regional planning. LDCs can take advantage of provisions in the framework to permit scaling up across multiple LDCs. As an example, Section 2.3 of the Minister of Energy's direction to the OPA on the Conservation First Framework encourages distributors to aggregate their individual conservation targets and work co-operatively to develop regional CDM plans to meet regional targets. In addition, there are shorter approval times for joint LDC plans, and an OPA collaboration fund supports LDC teamwork on joint CDM plans. These help put conservation on an equal footing with supply solutions in a given region – perhaps to the point where it could match the avoided costs and replace a major regional supply infrastructure project.

The ECO believes that providing strong incentives to LDCs to pursue conservation for specific regional planning reasons would result in more conservation in regional plans. Incentives for directing programs at specific geographic areas or peak demand hours are examples. Focusing on regional peak demand savings may be necessary since the LDC conservation targets contained in the Minister of Energy's direction on the Conservation First Framework are energy targets (kilowatt-hour); there are no LDC peak targets (kilowatts) and, therefore, LDCs have little reason to pursue residential demand response programs like *peaksaver* PLUS.[98] Section 3.5 (iv) of the direction encourages the OPA to incent CDM measures that consider system value, including reductions at peak times. The ECO suggests that the performance incentive mechanism in section 1.6 of the Minister's direction be amended to achieve such outcomes.

How successfully regional electricity planning can be integrated with other local plans (e.g., municipal plans and community energy plans) depends on whether the government implements the OPA-IESO report's recommendations. These include recommendations designed to: incorporate energy decisions into municipal Official Plans; and strengthen the Provincial Policy Statement, provincial plans and legislation.

Alternative Means to Strengthen Consultation

Use of a Rejuvenated Environmental Assessment Act

The regional planning process is undeniably complex. While the planning options are straightforward – conserve electricity, build power plants or add wires[99] – navigating the process is difficult due to its many components. The complexity arises from the proliferation of planning processes (see Figure 9) and the difficulty in reaching consensus among multiple groups holding divergent views about numerous issues (e.g., the infrastructure's impact on the environment, health, property values and power bills). Given this convoluted planning process, the IRRP may not be the cure for what ails electricity planning; it may be just one more symptom of the problem.

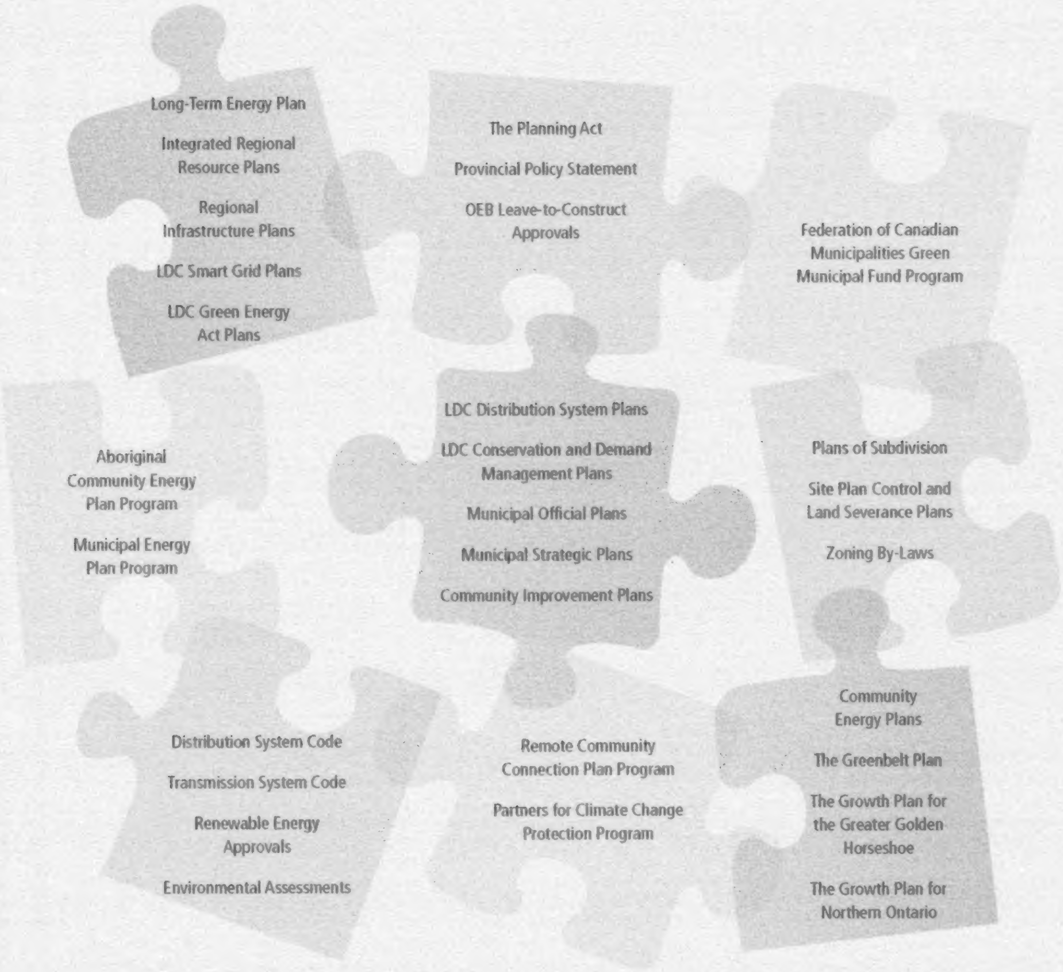

Long-Term Energy Plan
Integrated Regional Resource Plans
Regional Infrastructure Plans
LDC Smart Grid Plans
LDC Green Energy Act Plans
The Planning Act
Provincial Policy Statement
OEB Leave-to-Construct Approvals
Federation of Canadian Municipalities Green Municipal Fund Program
Aboriginal Community Energy Plan Program
Municipal Energy Plan Program
LDC Distribution System Plans
LDC Conservation and Demand Management Plans
Municipal Official Plans
Municipal Strategic Plans
Community Improvement Plans
Plans of Subdivision
Site Plan Control and Land Severance Plans
Zoning By-Laws
Distribution System Code
Transmission System Code
Renewable Energy Approvals
Environmental Assessments
Remote Community Connection Plan Program
Partners for Climate Change Protection Program
Community Energy Plans
The Greenbelt Plan
The Growth Plan for the Greater Golden Horseshoe
The Growth Plan for Northern Ontario

Figure 9: Ontario's Complex Planning Process

Blue – Plans and planning processes used in Ontario at provincial and municipal levels.

Orange – Approvals required and codes and regulations affecting planning at provincial and municipal levels.

Green – Program funding assistance for planning available in Ontario.

The IRRP process lacks accountability because there are no legal (i.e., statutory) requirements on the type and level of consultation required (unlike those contained in the Integrated Power System Plan, the *Environmental Assessment Act* or the *Ontario Energy Board Act*). In effect, the OPA itself can decide the appropriate level of consultation, although this may change as the government implements the recommendations of the OPA-IESO report. Electricity planning is no longer a narrow engineering exercise that simply determines the need for infrastructure and ranks options by cost and reliability, typically without public input. It is an open question whether Ontario's IRRP process is sufficiently transparent to provide meaningful open debate of issues.

The ECO suggests that the government has reinvented the wheel and created yet another process when an existing one – an EA – could have served the same purpose. The ECO believes that the government should use the opportunity presented by electricity infrastructure planning to revisit the role of the *Environmental Assessment Act*. As the OPA-IESO report notes, if full Individual EAs were required for all large generation stations (as the Act originally intended), proponents would have to consider the need for a project and alternative solutions to meeting regional electricity needs, as well as mitigation measures. This would also result in extensive public consultation, and would focus a spotlight on site selection, approvals and permits.[100]

In the ECO's view, an appropriate model is one where EAs are nested within approval mechanisms of the Integrated Power System Plan, the Integrated Regional Resource Plan and Large Renewable Procurement processes. The IPSP would be subject to a full Individual EA, and more scoped EAs could be used in the IRPP or Large Renewable Procurement processes for site selection of major infrastructure projects.

As the ECO has argued before, a review of the *Environmental Assessment Act* is overdue.[101] Such a review should reaffirm the original intent of the Act as a framework for a transparent planning process that considers the rationale (i.e., need) for infrastructure while enabling public input – precisely the objectives of the Minister of Energy's May 2013 directive that launched the review of regional planning.

A review of the *Act* would allow an examination of fundamental flaws related to approval of electricity projects. For example, O. Reg. 276/06 exempts the Integrated Power System Plan from being subject to an environmental assessment under the *Environmental Assessment Act*. A review of the Act would also allow Ontarians to revisit such features as: the discretion of the Minister of the Environment and Climate Change to scope the terms of reference (i.e., the work plan of what will be studied during the EA) and to exclude certain issues (such as need and alternatives); and the appropriateness of the simplified screening process set out in O. Reg. 116/01. Whether these features of current environmental approvals ultimately aid or impede public acceptance and sound siting decisions are issues worth examining.

2.6 A NEW GREATER TORONTO AREA GAS PIPELINE – COULD IT HAVE BEEN AVOIDED THROUGH CONSERVATION?

2.6.1 INTRODUCTION

Pipelines of all stripes dominated the energy news in 2013. Within Ontario, two major oil pipeline projects were proposed: Enbridge Inc.'s Line 9 reversal and TransCanada's Energy East project. Nationally, debates swirled around the Keystone XL and Northern Gateway pipelines. Flying under the radar was a proposal by Ontario's two major natural gas distributors – Enbridge Gas Distribution Inc. and Union Gas Limited – to jointly invest more than one billion dollars in new natural gas pipeline infrastructure. The combined Greater Toronto Area-Parkway (GTA-Parkway) Proceeding will be the largest capital investment in the history of the two companies. The proposal was reviewed by the Ontario Energy Board (OEB) and ultimately approved in January 2014. As a result, customers of Union Gas and Enbridge will eventually pay the cost of the project. This cost may be offset if the project is successful in improving access to lower-priced sources of natural gas; however, offsetting infrastructure costs through lower gas prices is not certain.

At the Board hearing, opponents argued that some components of the GTA-Parkway Proceeding could have been avoided if there was an increased emphasis on targeted natural gas conservation within the Greater Toronto Area. Although the argument proved unsuccessful, it has implications for future infrastructure proposals. The hearing led the Board to re-examine the role that natural gas conservation programs can and should play as potential alternatives to hard infrastructure.

The GTA-Parkway Proceeding provides an opportunity to examine how conservation is considered when gas companies seek OEB leave (permission) to construct a pipeline and related infrastructure. The evidence suggests that demand- and supply-side planning continue to exist as two solitudes with little integrated resource planning in Ontario's natural gas sector. In this section, the ECO suggests some solutions to remedy this segregated approach.

2.6.2 THE GREATER TORONTO AREA PIPELINE

Enbridge and Union Gas worked collaboratively to develop the complex infrastructure proposal. Both distributors proposed investments that would collectively allow more natural gas to move east from Union Gas's Dawn storage facility, located near Sarnia in southwestern Ontario. This would provide both Union Gas and Enbridge customers with greater access to lower-cost natural gas from shale deposits in the eastern United States, which have been unlocked in recent years through hydraulic fracturing.[102]

Union Gas's component of the project was estimated to cost $423 million for the construction of two natural gas compression facilities in Milton and approximately 14 kilometres (km) of new pipeline between Cambridge and Hamilton.

Enbridge's component – "the GTA pipeline" – was estimated to cost $686.5 million and involves two segments of pipeline. Segment A requires 27 km of a new 42-inch diameter pipeline running from Milton along the Highway 407 corridor to Highway 427/407 and will connect to the pipeline networks of Union Gas and TransCanada. Segment B, costing approximately $302 million, requires 23 km of a new 36-inch diameter pipeline through Vaughan, Toronto, Markham and Richmond Hill.

Segment B, particularly the north-south portion, was particularly controversial because it is not directly needed to improve access to lower-cost gas supplies for Enbridge customers. Rather, Segment B expands Enbridge's capacity to move gas around within its internal distribution network, while the main rationale for the north-south portion is to increase the maximum rate at which natural gas could be delivered to customers in Toronto. For this component of the GTA pipeline, conservation is thus a potential alternative to infrastructure investment.

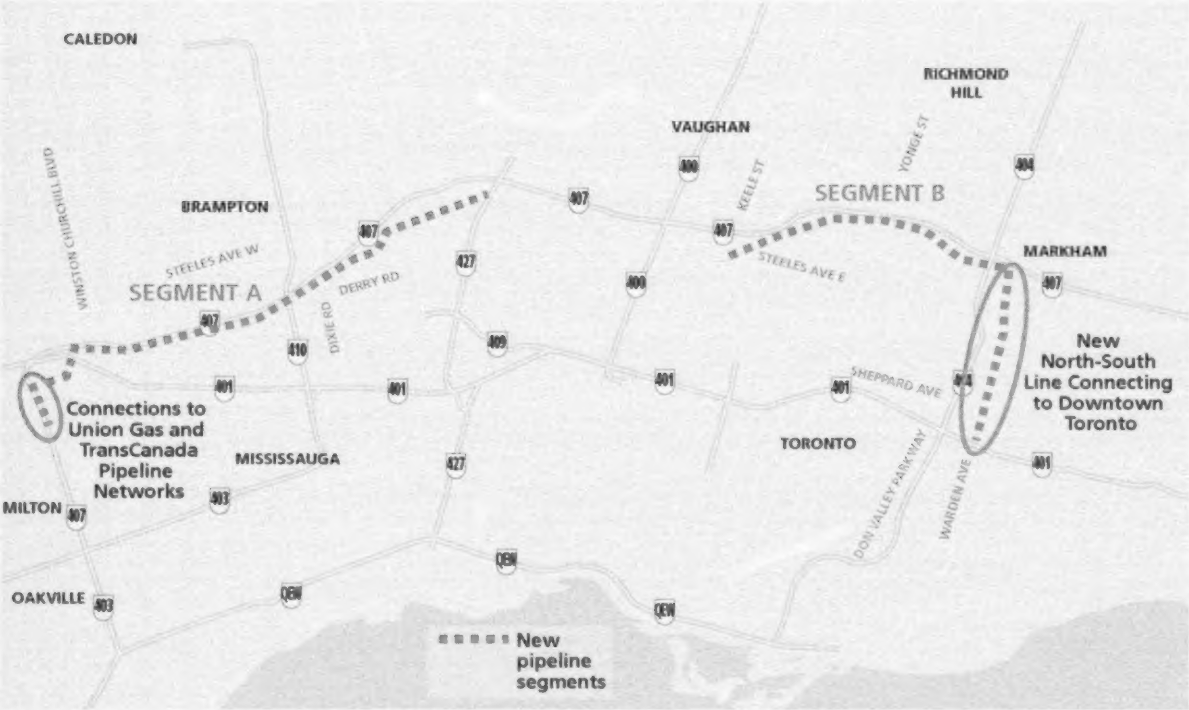

CALEDON
RICHMOND HILL
VAUGHAN
YONGE ST
KEELE ST
BRAMPTON
SEGMENT B
MARKHAM
WINSTON CHURCHILL BLVD
STEELES AVE W
STEELES AVE E
SEGMENT A
DERRY RD
DIXIE RD
New North-South Line Connecting to Downtown Toronto
SHEPPARD AVE
Connections to Union Gas and TransCanada Pipeline Networks
MISSISSAUGA
TORONTO
MILTON
DON VALLEY PARKWAY
WARDEN AVE
OAKVILLE
New pipeline segments
407
400
404
427
410
409
401
403
QEW

Figure 10: The GTA Pipeline Project

Source: Enbridge Gas Distribution

Enbridge's Rationale for Segment B

The natural gas supply for much of Toronto, including the downtown core, is heavily reliant on a 30-inch pipeline running north-south parallel to the Don Valley Parkway. There is an upper limit to the rate at which natural gas can flow through any pipeline, set primarily by the pipe size and by the need to keep pipe pressure within safe operating conditions. In Enbridge's opinion, the existing Don Valley pipeline was close to reaching this upper limit, and a second line was needed.[103]

Enbridge explained that Segment B was needed to meet an increased peak demand for natural gas, driven by customer growth, particularly new development in the downtown Toronto core. Enbridge added approximately 150,000 customers between 2004 and 2014, and expects a further 150,000 new customers between 2015 and 2024. Enbridge argued that this growth required that Segment B of the GTA pipeline be built as soon as possible; otherwise, the operating conditions "required to provide reliable service in the downtown core of Toronto in [the] 2015/2016 heating season will not be satisfied."[104]

The gas distribution network is built to meet customers' maximum (peak) demand, which typically occurs on the coldest winter days. Enbridge noted that the peak day demand for the area served by the GTA pipeline project has grown on average by 1.5 per cent annually since 1999 and is forecast to continue increasing. However, the total amount of natural gas used annually by Enbridge customers within the GTA project area has remained relatively flat over the past ten years. This is due in large part to conservation efforts, as reduced energy use per customer has offset the large increase in the number of customers.

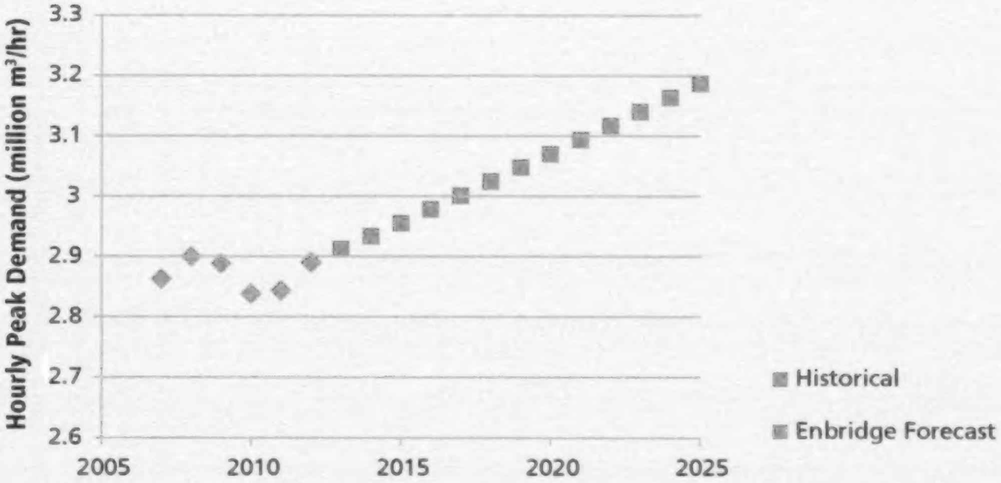


Figure 11: Peak Natural Gas Demand in the GTA Project Area

Source: Enbridge Gas Distribution

A changing GTA customer mix accounts for the divergent trends in peak demand and total gas consumption. Compared with a decade ago, residential customers account for a greater share of system use. These customers primarily use natural gas for space heating, resulting in a very weather-sensitive pattern of gas consumption where usage peaks during cold winter weather. Industrial customers (who have a more stable pattern of energy use that is less tied to external weather conditions) make up a smaller portion of the system mix today. In the GTA today, the amount of natural gas consumed on a peak day is roughly three times the amount of natural gas consumed on an "average" day.

Beyond the immediate concern about meeting a growing peak demand, Enbridge also suggested that Segment B would bring other benefits. It would increase reliability by reducing dependence on a single major pipeline serving the downtown core. Adding a second pipeline would also allow Enbridge to lower the operating pressure of the existing pipeline, which reduces both the risk of a pipeline breach and the consequences of such a failure.[105]

2.6.3 THE ALTERNATIVE OF CONSERVATION

Several environmental groups participated in the hearing and opposed the Enbridge GTA Pipeline project (particularly the north-south component of Segment B).[106]

The groups raised technical objections as to whether Enbridge had overstated the need for a new pipeline and the company's forecast of future peak demand levels was questioned. Opponents of the pipeline argued that Enbridge's methodology for predicting future peak demand was approximate and unclear. In particular, they claimed that Enbridge had not properly accounted for the increasing energy efficiency of buildings. They also noted that the conclusions drawn from the historical data trends depended quite heavily on what year was used as a starting point – by varying the starting date in the analysis, the historical data could be used to argue that peak demand was, in fact, flat and not increasing.

The groups agreed that reducing the operating pressure on the existing Don Valley line was desirable. However, they noted that hundreds of kilometres of pipelines in both the Union Gas and Enbridge networks operated at similar pressures, and there were no specific risks that required operating pressure to be lowered immediately on the Don Valley line.

More fundamentally, the groups argued that Enbridge's proposal was essentially incompatible with the Ontario government's policy goal to deeply cut greenhouse gas emissions; additionally, it was not the cheapest way of meeting customer energy needs. As an alternative, they proposed that Enbridge strengthen its conservation efforts to avoid the projected increase in peak demand and bring down the operating pressure of the current line over time, thus making the large investment in a new pipeline unnecessary.

At the hearing, Enbridge filed a brief discussion of alternatives to the GTA pipeline project that it had considered. Even though demand-side management (DSM) was listed as an alternative, Enbridge summarily dismissed it in a few pages: its main argument was that conservation programs designed to reduce natural gas consumption do not necessarily reduce peak demand.[107] Enbridge offered the example of programmable thermostats that might cause multiple furnaces to fire up about the same time of day when occupants wake up. During the hearing, however, Enbridge admitted this example was exceptional because most conservation measures will also reduce peak demand, although the exact relationship between energy and peak demand savings varies significantly depending on the measure. Enbridge also noted that it does not actively track or calculate the impact on peak demand of specific conservation measures.

2.6.3.1 HOW TO MODIFY CONSERVATION PROGRAMS TO AVOID BUILDING NEW INFRASTRUCTURE

Gas conservation programs can help utilities avoid building new infrastructure. Increasing the budget for conservation programs is one obvious way to boost their effectiveness. But even without increased funding, conservation programs can be adjusted to avoid infrastructure investments. For example:

- Conservation programs could be targeted at specific geographic areas where infrastructure investments would otherwise be needed. Within these areas, unique conservation programs or higher program incentives to customers could be offered.
- Conservation programs could focus on actions that yield high peak demand savings, as well as total natural gas savings. For example, an action that reduced winter space heating use would be more valuable than one that reduced industrial process heating.
- Pricing tools could reduce peak demand. For example, Enbridge could charge lower delivery rates in summer versus winter or encourage customers to sign up for interruptible rates. Interruptible rates are lower priced. In exchange, the customer accepts the possibility of temporary interruption of delivery when conditions are particularly tight (approximately three per cent of the load in the GTA project area is already on interruptible rate contracts). These tools for reducing natural gas peak demand are analogous to time-varying pricing and demand response programs in the electricity sector, which are both major parts of Ontario's conservation toolbox (see Section 2.7)

Of course, an exclusive focus on avoiding infrastructure investment may mean that natural gas conservation programs are not quite as effective at achieving other goals, such as reducing greenhouse gas emissions or energy bills for vulnerable consumers.

2.6.4 PIPELINE APPROVED

Ontario Energy Board
Commission de l'énergie de l'Ontario

EB-2012-0433
IN THE MATTER OF AN APPLICATION BY
UNION GAS LIMITED
LEAVE TO CONSTRUCT THE PARKWAY WEST PROJECT

EB-2013-0074
IN THE MATTER OF AN APPLICATION BY
UNION GAS LIMITED
LEAVE TO CONSTRUCT THE BRANTFORD-KIRKWALL/PARKWAY D PROJECT

EB-2012-0451
IN THE MATTER OF AN APPLICATION BY
ENBRIDGE GAS DISTRIBUTION INC.
LEAVE TO CONSTRUCT THE GTA PROJECT

DECISION AND ORDER

JANUARY 30, 2014

In January 2014, following a lengthy hearing, the OEB granted Union Gas and Enbridge leave to construct all portions of the proposed project, including Segment B of Enbridge's GTA pipeline.[108] Construction is expected to finish in October 2015.

The Board was not entirely unsympathetic to the argument for conservation as an alternative, stating that "the Board accepts that targeted DSM programs and/or rate design options might in some circumstances mitigate the need for Segment B."[109] However, the Board also noted uncertainty over both the ability to quickly restructure and scale up conservation programs to offset the need for the pipeline, and the cost of the programs. The Board also identified another information gap: Enbridge's inability to quantify how annual gas savings from conservation translate into peak demand savings. These uncertainties led the Board to conclude that the supply-side approach of proceeding with the GTA pipeline was preferable.

Although the Board approved the GTA pipeline, it made its concerns with the status quo clear, stating that, in future, "the Board expects applicants to provide a more rigorous examination of demand-side alternatives, including rate options, in all gas leave to construct applications."[110] The Board also indicated that, at some point in the future, it would examine integrated resource planning (i.e., a comparison of demand- and supply-side solutions to infrastructure needs) for gas utilities. The Board noted that some of the issues raised in the GTA pipeline hearing could be considered at that time.[111] The current and future policy and regulatory framework governing natural gas system planning in Ontario are discussed in Sections 2.6.5 and 2.6.6.

2.6.5 NO INTEGRATED RESOURCE PLANNING TODAY

DEMAND SIDE MANAGEMENT GUIDELINES
FOR NATURAL GAS UTILITIES

EB-2008-0346

Date: June 30, 2011

Ontario's gas utilities ensure their customers have access to both a dependable supply of natural gas and to gas conservation programs. However, these activities exist largely in different worlds. This is somewhat ironic as the OEB first examined integrated resource planning for gas utilities 20 years ago; in fact, the lineage of today's utility conservation programs can be traced directly back to that hearing.[112] However, the Board never followed through with plans at that time to integrate demand-side and supply-side planning.

Today, on the supply planning side, utilities must evaluate whether system expansions are generally in the economic interest of existing customers. However, these evaluations compare the economic impact of a project with doing nothing; they are not intended to provide an economic comparison with other options, such as conservation.

On the conservation side, the policy framework for gas conservation programs is set by the OEB's *Demand Side Management Guidelines for Natural Gas Utilities*. Under the current guidelines, the primary goal of conservation programs is to maximize the total amount of cost-effective natural gas savings, and not to directly offset supply infrastructure. As noted in Section 2.6.3.1, achieving the latter objective would likely require a modified set of conservation programs that focus, for example, on specific geographic areas of constrained capacity or on such measures as peak demand shaving (i.e., reducing gas usage on cold winter days and nights).

Integration of energy supply and conservation in system planning is much more advanced in Ontario's electricity sector. For many years, the main driver of many electricity conservation programs has been their potential to reduce peak electricity demand. This avoids the infrastructure investments (primarily new electrical generating stations, but also transmission and distribution lines) that would otherwise be needed to supply peak demand. Consequently, all incarnations of the electricity system plans over the past decade have included the role that both conservation and supply infrastructure can play in meeting customer electricity needs (see Sections 2.3 and 2.5). This concept is known as integrated resource planning.

Enbridge's development of the GTA pipeline proposal, and the OEB's approval, reflected the lack of a legal requirement for integrated resource planning in the gas sector. The Board noted that any consideration of conservation as an alternative to the pipeline by Enbridge was "cursory at best" and that "evidence is clear that no staff with DSM expertise attended the relevant [internal planning] meetings."[113] Enbridge itself acknowledged that it had not conducted integrated resource planning, and argued it could not have been expected to do so. Enbridge further commented that "[p]ipeline capacity is real, while reliance upon DSM to provide capacity through reduced peak demand is purely speculative."[114]

Integrated Resource Planning in Other Jurisdictions

Several other jurisdictions have mandated integrated resource planning for gas utilities, although this is not the norm.

BURIED GAS
BURIED GAS

As one example of a legal framework that supports integrated resource planning, British Columbia's *Utilities Commission Act* requires both gas and electric utilities to file long-term integrated resource plans. BC utilities must estimate how energy demand is expected to change over the planning period, and how conservation can impact this demand forecast. Most relevant to the GTA pipeline hearing, BC utility plans must describe new facilities that the utility intends to develop to meet customer demand, and then justify why this demand cannot be met instead by conservation measures.[115]

Even though integrated resource planning is being introduced in some jurisdictions, its ability to deliver concrete results through conservation is untested. At the GTA pipeline hearing, the groups proposing conservation as an alternative solution were unable to cite an example from another jurisdiction where a utility had specifically used geo-targeted conservation programs to successfully avoid supply infrastructure investments.

This caveat does not mean that integrated resource planning is a bad idea; indeed, experience in the electricity sector shows that the approach can be very valuable. It does mean, however, that there will be a learning curve for both utilities and their regulators, as they become more familiar with an integrated planning approach. Issues like the accuracy of demand forecasts and the ability of conservation programs to reduce peak gas demand will need to be better understood and addressed in regulatory proceedings.

2.6.6 INTEGRATED RESOURCE PLANNING TOMORROW?

Ontario Energy Board

EB-2014-0134

Draft Report of the Board

Demand Side Management Framework for
Natural Gas Distributors

September 15, 2014

In March 2014, the Minister of Energy directed the OEB to develop a new policy framework ("the DSM framework") that will provide guidance to Enbridge and Union Gas on the natural gas conservation programs they will offer from 2015 to 2020. The directive includes a specific instruction to examine integrated resource planning: "By January 1, 2015, the Board shall have considered and taken such steps as considered appropriate by the Board towards implementing the government's policy of putting conservation first in Distributor and Gas Distributor infrastructure planning processes at the regional and local levels, where cost-effective and consistent with maintaining appropriate levels of reliability."[116]

The new DSM framework had not been finalized as of December 2014, but a draft DSM framework was released by the Board for public comment in September 2014.[117] Some of the proposals in the draft DSM framework respond to the issues raised at the GTA pipeline hearing.

The new draft 2015-2020 DSM framework states that one of the key goals of natural gas conservation programs should be to "avoid costs related to future natural gas infrastructure investment including improving the load factor of natural gas systems."[118] Similarly, a guiding principle of the new DSM framework is to "ensure DSM is considered in gas utility infrastructure planning at the regional and local levels,"[119] including the potential to avoid or defer infrastructure investments through geographically targeted conservation efforts.

The draft DSM framework proposes that Enbridge and Union Gas should each conduct a study within the next few years to determine the role of DSM in serving future system planning, and that all future leave to construct applications must include evidence of how DSM has been considered. As a caution, the draft DSM framework also notes that, unlike electricity, only a portion of the infrastructure for the natural gas system lies within Ontario (as the natural gas itself is usually produced and transported from outside Ontario), so there may not be as great a role for conservation to reduce infrastructure costs for Ontario gas ratepayers as there is in the electricity sector.

ECO Comment

The ECO is not necessarily convinced that Segment B of the GTA pipeline could have been avoided, but the ECO is persuaded by arguments that conservation was never given a fair chance as an alternative.

Evidence brought out at the OEB hearing demonstrated that proof of increasing peak gas demand in the GTA was weak, and that Enbridge's methodology to forecast future peak demand was quite crude.[120] Thus, the ECO is unconvinced by Enbridge's argument that the north-south portion of the GTA pipeline needed to be built immediately to meet imminent customer demand. It is likely that any shortfall could have been avoided by only modest adjustments to Enbridge's conservation programs, coupled with natural trends towards increasing energy efficiency.

However, it is unclear to the ECO whether conservation could have led to the larger reductions in natural gas use that would allow Enbridge to lower the maximum pipeline pressure in the existing Don Valley pipeline, or to achieve the additional reliability benefits associated with adding a second line. These benefits may justify the GTA pipeline project. However, Enbridge should have provided a more comprehensive assessment of whether the north-south portion of the pipeline was justified on these grounds alone.

How will future decisions on infrastructure investment be shaped by the GTA pipeline hearing? The Minister's directive to the OEB and the OEB's new draft DSM framework guidelines for natural gas conservation programs are much-needed steps in the right direction. If fully implemented, the DSM framework should help ensure that the gas utilities choose the lowest cost solution to meeting the energy needs of Ontarians. It is unfortunate that these steps have been taken only after the approval of the GTA pipeline, as it is unlikely that Enbridge or Union Gas will undertake additional infrastructure projects of this size in the near future.

The ECO makes five suggestions that we encourage the OEB and gas distributors to consider as the DSM framework is implemented.

1. Utilities should be required to publicly identify potential infrastructure projects as far in advance as feasible to allow for proper consideration of demand-side alternatives.

This is a timing issue. When Enbridge applied to the OEB in December 2012 to construct the GTA pipeline, the proposed in-service date of the project was only three years away. At such a late date (if one accepts Enbridge's assertions about the imminent shortfall in the ability of the existing infrastructure to meet customer demand), conservation efforts would have needed to be massively scaled up to have any chance of avoiding pipeline construction. Yet Enbridge had been aware of the increasing strain that customer growth was placing on the company's existing supply pipeline for downtown Toronto since 2002.[121] Had Enbridge (and other interested parties) examined what role conservation could play back then, the outcome may have been different. A requirement for advance disclosure of potential future projects could avoid a recurrence of this outcome.

WARNING
GAS
PIPELINE
IN AREA

The ECO recommends that the Ontario Energy Board require natural gas utilities to file advance notice of any identified distribution system need that could have significant cost impact, and ensure conservation is considered as the first resource to meet some or all of this need.

2. The OEB should review whether guidelines for utility demand forecasting are needed.

As noted in this section, the accuracy of Enbridge's demand forecast was a subject of much debate at the GTA pipeline hearing. This made it difficult for the OEB to assess whether conservation was a viable alternative because it was unclear how much peak demand reduction would be needed from conservation efforts. It may be worthwhile for the OEB to provide guidance to utilities as to how demand forecasts should be calculated, which would remove this as an issue of debate at project-specific hearings.

3. The OEB should examine whether utilities should have equal incentives to invest in supply and demand-side solutions.

Currently, gas utilities can profit either from building new infrastructure (through a Board-determined return on equity) or from successfully delivering conservation programs (through annual performance incentives). However, the potential return on supply-side investments is much higher.[122] This introduces a risk that utilities may place more emphasis on supply-side solutions. The new draft DSM framework does not examine how these incentives compare or how the discrepancy in incentives might influence utility actions.[123] In the ECO's view, this is an issue that deserves further review. One option that could be considered would be to set a different structure of incentives for targeted conservation programs that successfully avoid specific infrastructure investments.

4. Utilities should assess the ability of their conservation program offerings to reduce peak demand.

Enbridge used 'lack of information' as one argument to discount the possibility that conservation could eliminate the need for the GTA pipeline. This information gap should be filled, and it is an area where the electricity sector is far ahead. The Ontario Power Authority estimates "8,760 hour" energy profiles for electricity conservation measures (i.e., a profile for every hour of the year), allowing it to predict what effect any conservation measure will have on reducing peak demand.[124] Establishing similar estimates for natural gas conservation measures should be a key task for utilities and their technical evaluation committees. While more precise estimates are always desirable, the 'perfect' should not be the enemy of the 'good.' As with current estimates of annual energy savings, estimates of peak demand reduction can be set based on the best available information and can be refined as more data becomes available.

5. The OEB should not allow utility spending on conservation programs designed to reduce the need for new infrastructure to cannibalize spending on traditional gas conservation programs designed to reduce overall natural gas consumption.

While the ECO supports exploring the potential for using conservation programs to avoid infrastructure investments, some caution is in order. Some types of demand-side actions that could reduce infrastructure investments, particularly those that focus on shifting consumption away from peak periods, would have little impact in reducing total natural gas consumption and greenhouse gas emissions.[125] The latest advice from the Intergovernmental Panel on Climate Change tells us there is more need than ever for traditional conservation programs that focus on these goals. Yet the draft guidelines contain the risk that every dollar spent on infrastructure-related conservation programs would mean that a dollar less would be available for other types of conservation programs. This should not be an 'either/or' situation. Conservation efforts to reduce peak demand, where cost effective, should supplement those designed to reduce overall natural gas consumption.

The ECO recommends that the Ontario Energy Board allow utilities to increase their conservation budget if targeted conservation spending would avoid greater future infrastructure costs.

The ECO also notes that the OEB's traditional concern about the budget impact of conservation programs is less relevant for infrastructure-avoidance programs that meet this requirement. By definition, these programs would deliver benefits (through lower infrastructure costs) to all ratepayers, not just the customers that participate in the conservation programs.

If these five issues are addressed, the ECO believes that the Ontario Energy Board will be much closer to realizing the Minister of Energy's direction to put conservation first in natural gas distributor infrastructure planning.

2.7 EMBEDDING THE CUSTOMER IN CONSERVATION

2.7.1 INTRODUCTION

Conservation requires the careful use of natural resources to prevent loss or waste. For example, our daily behaviour plays a key role in reducing the use of energy resources. If people simply use less energy, then less supply is needed. While this sounds easy enough, getting people to alter their behaviour is a challenging task.

Why undertake this challenge? Ontario's electricity system is sized to meet the highest demand for power that occurs at one specific point during the year.[126] Typically this occurs in mid-afternoon on a hot summer day when air conditioners are running at their highest. Energy conservation programs are a cost-effective way to reduce or even eliminate the need for new infrastructure, such as difficult-to-site power plants, transmission lines and pipelines. Making customers an active partner in conservation – embedding them in conservation – shows them how to use less energy and to use what they do take more efficiently. This engagement can help reduce the need to build new energy supply resources as peak demand grows.

Several approaches can be used to engage customers. A key method is how we *price* electricity. Ontario has designed its electricity pricing policies to encourage consumers to reduce overall electricity use or shift it from on-peak to off-peak times. At the same time, the government and its agencies are distributing and promoting easy-to-understand information on the electricity market, energy bills and the value of conservation. The stated goal is to put "conversation first" in Ontario's long-term energy planning.

This section reviews electricity pricing policies for small and large consumer groups. It also examines how the Ministry of Energy has increased consumers' access to their own consumption data and has informed the public on the benefits of using less energy. Unlike other conservation programs, these information campaigns do not promote specific energy-efficient technologies; instead, they encourage customers to act on their own initiative to adjust their patterns of electricity use.

2.7.2 THE POWER OF THE POCKETBOOK: CONSERVATION THROUGH ELECTRICITY PRICES

Under Ontario's pricing policies, both the amount of electricity a customer uses and when they use it affects the size of their bill and how they are charged.[127] Smaller consumers, like households and small businesses, generally pay time-of-use (TOU) rates under the Regulated Price Plan (RPP), as set by the OEB. A different approach is used to charge large-volume customers, such as universities and manufacturers, for their electricity use (see Section 2.7.2.1). Additional discussion on these charges (and what they mean) is contained in the ECO's *2010 Energy Conservation Progress Report (Volume One)*.[128]

Ontario's pricing policies offer opportunities to encourage different types of energy conservation. For example, the price differential between different TOU price periods for smaller customers can encourage them to *shift* some of their electricity use from on-peak to off-peak times. Likewise, large customers' exposure to the wholesale market price provides an incentive to *reduce* consumption when it is more expensive. And the recently created Industrial Conservation Initiative (ICI) encourages these customers to further conserve by reducing or shifting demand during very high or critical peak demand times. The following discussions focus on the first available data that track the impacts of Ontario's TOU rates and the ICI on energy use.

2.7.2.1 ELECTRICITY PRICING 101

Large electricity consumers pay the real-time market price for electricity (i.e., the wholesale market price, also referred to as the Hourly Ontario Energy Price or HOEP). This varies throughout the day and reflects the cost of electricity generation at a given point in time.

The Global Adjustment accounts for the differences between the wholesale market price and the rates paid to contracted generators and regulated generators (as well as payments for conservation programs). It is either a charge or credit, depending on market prices. Large electricity consumers see the Global Adjustment as a separate line item on their electricity bills. The Global Adjustment has become a significant item on electricity bills, even exceeding the Hourly Ontario Energy Price.

The Industrial Conservation Initiative, launched in January 2011, changes how the Global Adjustment is calculated for the very largest electricity customers, essentially acting as a form of critical peak pricing. This initiative offers participating customers the opportunity for large savings on their bills, through lower Global Adjustment payments, if they reduce their electricity use at times when Ontario-wide electricity demand is very high.

The Ontario Energy Board sets time-of-use (TOU) rates for smaller electricity consumers. Unlike large customers, small customers' Global Adjustment payments are bundled into their TOU rates and not displayed as a separate line item on their bills.[129] TOU rates are set every six months by the Board, which estimates how much power Regulated Price Plan customers will use and the approximate cost of this power. Prices are based on these estimates, and adjusted to account for any difference between estimated and actual costs from the previous six-month period.

On-peak electricity savings reduce greenhouse gas emissions in Ontario since peak generation is typically produced by natural gas-fired power plants. Hence, reducing on-peak energy demand has climate change benefits.

2.7.3 TIME-OF-USE RATES (SMALL VOLUME CONSUMERS)

TOU rates reflect the variable nature of electricity generation costs. In Ontario, this pricing policy sets three different price periods (on-peak, mid-peak and off-peak) over two different seasons (May through October and November through April). The rates were first introduced to some eligible customers in 2006, and the province has since transitioned virtually all small volume consumers to TOU rates. Just over 90 per cent of Ontario homes and small businesses are now on this pricing structure.[130]

Some years after TOU rates began to roll out across the province, the OEB publicly consulted on its TOU price setting methodology. A consultant prepared an analysis of Ontario's existing TOU pricing regime for the Board, creating a snapshot of the situation in 2010, when Ontario's on-peak to off-peak price ratio was 1.9 to 1, and about 1.2 million customers were on TOU rates.[131]

The consultant noted several features of Ontario's TOU design were aligned with industry best practices, such as the use of a three-period rate that differs with the seasons.[132] However, the consultant also commented that Ontario's on-peak to off-peak price ratio differed significantly from practices in other jurisdictions. The average price ratio in other jurisdictions was much steeper: approximately 4 to 1 (with a mean ratio of 3.8 to 1). The consultant's report included alternative approaches that Ontario could take to increase its ratio. While a higher ratio has been effective in influencing more users to shift to off-peak times, the majority of stakeholders advised that it was premature to change the TOU pricing structure without sufficient Ontario-specific data on which to base changes.[133]

The OEB has maintained its price-setting methodology. There is no specific policy direction that guides the Board to set an on-peak to off-peak price ratio. Instead, the difference between off-peak, mid-peak, and on-peak prices arises automatically from the way that the Board allocates the costs of operating the electricity system to the different TOU periods. For example, the cost of running demand response programs and operating natural gas plants is primarily recovered through on-peak prices because these primarily are used to meet peak demand. This "cost-causality" approach has the advantage of being the fairest way to recover current costs from customers; however, it sacrifices the ability to specify a higher on-peak to off-peak price ratio that could provide a stronger incentive to reduce peak demand and potentially lower costs for all customers.

Board staff recommended that the OEB collect and monitor data to provide Ontario-specific information for future analyses.[134] Staff also noted that pilot projects could be a useful tool to test the effectiveness of alternative pricing options before making any material changes to the TOU pricing policy.[135] Clearly, data collection and analyses with Ontario-specific information are needed.

First Ontario Data Show Time-of-Use Rates are Reducing Peak Demand

Shortly after the OEB's 2010 consultation on Ontario's TOU rates, the Board began a study to examine the impact of these rates in Ontario. The OPA also started its own study (for different reasons) partly because LDCs can claim electricity savings from TOU rates toward their 2014 Conservation and Demand Management targets (see Section 3.3). The first reports from these two TOU studies were released in November and December of 2013. While each serve different purposes, both use multi-year data directly acquired from LDCs (see Table 5).

Overall, both studies found a small, but observable, drop in on-peak residential electricity demand during the summer months. This suggests that TOU rates can effectively reduce peak demand in Ontario, despite the relatively small ratio for on-peak to off-peak electricity prices.

Table 5: Summary of TOU Studies by the Ontario Power Authority and Ontario Energy Board from 2013

Agency	Ontario Power Authority	Ontario Energy Board
Report Release Date	November 26, 2013	December 20, 2013
Consultant Company	The Brattle Group	Navigant Consulting Ltd.
Purpose of Report	To measure the change in electricity use by pricing period for certain residential and general service customers (i.e., those with a peak demand less than 50 kW); to estimate the peak period impacts; and to estimate price responsiveness.[136]	To estimate the impact of historical TOU rates on a sample of customers.
Sample Size	Data was collected from four LDCs, which collectively represent about half of the province's population. Of some 140,000 customers sampled, 105,000 were residential customers and the rest general service customers.	Data from 16 LDCs was used for this analysis. Of about 14,000 customers, 10,000 were residential and the rest general service customers.
Time Period Examined	The report presents results only for the customers' first year of TOU rates. Actual dates vary since LDCs transitioned to TOU rates at different times. Using only the results from the first year of TOU rates provides a more "apples-to-apples" comparison across the four LDCs.	January 1, 2009 to May 31, 2013. Over the course of this time, customers were exposed to as many as nine different RPP TOU price ratios.

Agency	Ontario Power Authority	Ontario Energy Board
Main Findings	For residential customers: reductions in consumption during on- and mid-peak periods, and an increase in consumption during off-peak periods. Estimated residential summer on-peak reduction of 2.6 to 5.7%, depending on the LDC. No estimated megawatt amount was provided. For general service customers: some evidence of load shifting (i.e., shifting consumption from on- to off-peak times), but the impact is much smaller than observed for residential customers. Overall, evidence of energy conservation (i.e., total reduction in consumption as opposed to load shifting) was negligible and generally insignificant for both residential and general service customers.	For residential customers: results suggested that customers shifted consumption from on- and mid-peak periods to off-peak periods during the summer months. Estimated summer on-peak reduction of 3.3%. Assuming this is representative of the entire population of residential customers served by all provincial LDCs, the data suggest TOU rates saved about 179 MW during summer on-peak hours. In the winter, results suggest residential customers reduced their electricity use during all time periods. A winter on-peak reduction of about 3.4% was observed. For general service customers: findings were less clear than for residential customers. Statistically significant results were only available for the summer mid-peak time period; estimated mid-peak reduction was about 1.8%.
Report Publicly Available?	Yes	Yes
Greenhouse Gas Emissions Considered?	No	No
Recommendations	Not included in the report	Continue to collect residential smart meter data. Collect data from more residential customers. Collect data from more General Service customers and from a larger number of LDCs. On-going impact evaluation must rely on measuring the changes in electricity demand as a result of the changes to electricity rates. Undertake an on-going survey of customer behaviours and attitudes.
Next Steps	Since energy savings from TOU rates are part of the 2014 electricity conservation targets for Ontario's LDCs, the OPA continues to refine its analysis of the energy savings. In the second and third year of its analysis (2014 and 2015), more LDCs will be added – to increase geographical representation and customer diversity – and census information will be introduced. The goal is to produce a statistically significant, reliable and representative estimate of the province-wide impact of TOU rates.	The OEB has analyzed four alternative TOU price structures and estimated the impact these would have on consumer electricity demand and on the electricity system. The results were scheduled to be released in 2014. The OEB's most recent business plan indicates it will conduct a comprehensive review of the RPP, including TOU rates, in fiscal year 2014. If modifications to TOU rates occur, it will be in 2015.

Ontario Power Authority's Report (Brattle Group)

The OPA's report includes a graph that shows how consumers respond to different TOU rates based on the results of 42 international studies. Figure 12 illustrates the observed percentage of peak reduction achieved for a given on-peak to off-peak price ratio. The blue line marks the curve that best fits the data (referred to as "an arc of price responsiveness"), which can be used to predict the potential peak reduction resulting from a specified on-peak to off-peak ratio.

Ontario's current price ratio is approximately 1.8 to 1, which corresponds to an expected peak demand drop of approximately 4.5 per cent. This estimation is in-line with the results observed by the OPA and OEB. However, if the on-peak to off-peak price ratio were to increase to 5 to 1, then the arc of price responsiveness suggests that a peak reduction of 10 per cent or more could be achieved.

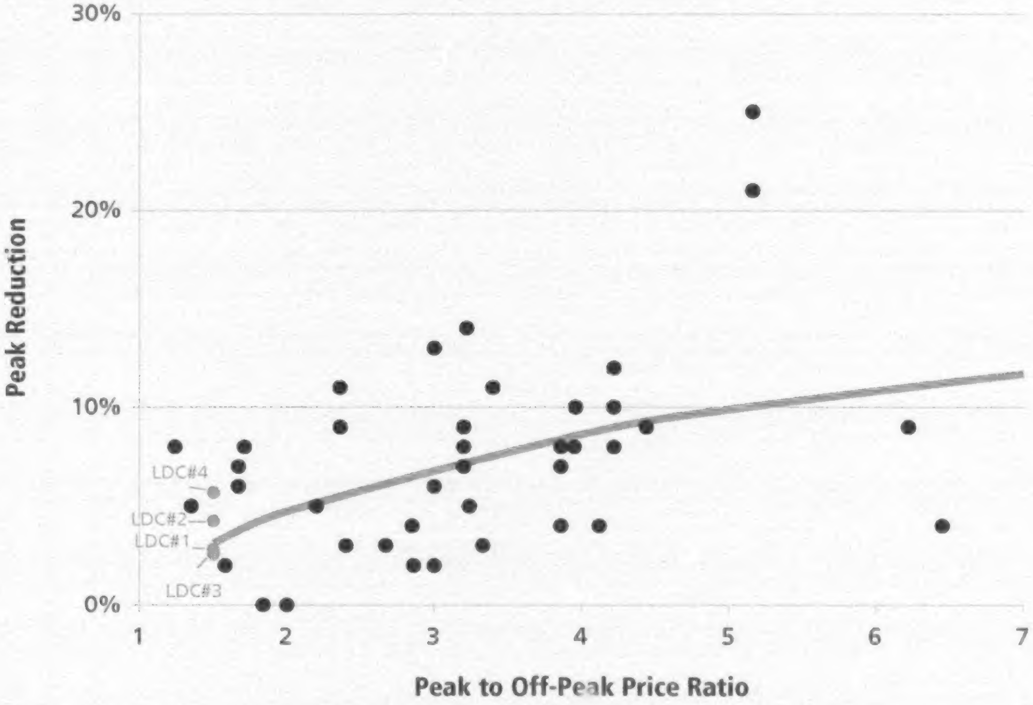


Figure 12: Ontario Residential TOU Impacts Compared to TOU Pilots from Around the Globe

Source: Ontario Power Authority

Ontario Energy Board's Report (Navigant Consulting)

Notable in the OEB's report is a recommendation to survey customers in order to learn more about their behaviours and attitudes in response to TOU rates. The report suggests the use of semi-annual customer surveys to provide the Board with access to ongoing information on customer attitudes and also give analysts more insight into electricity data.

The OEB has analyzed four alternative TOU price structures and estimated the impact these would have on individual consumer, as well as overall electricity system demand. The results should be released before the end of 2014. The Board will commence a comprehensive review of the RPP, including TOU rates, in 2014. If modifications to TOU rates occur, they will be in 2015.

ECO Comment

After the OEB and the OPA complete and release their pending TOU reports, the ECO will review these additional studies. In the meantime, the ECO offers some general comments on the analyses released in 2013.

First, the evidence indicates that Ontario's modest TOU price differential resulted in some peak demand savings during the summer months for residential customers; these results are encouraging. They suggest that some residential consumers are aware that their actions can save energy during times of peak demand.

Over the years, the ECO has monitored and reported on TOU prices and policies. Earlier ECO reports have noted that Ontario's price differential between on-peak and off-peak rates has narrowed over the years –

rising slightly, before falling sharply in 2008, and declining gradually thereafter (as shown in Figure 13) – to the point that it now sends a weak conservation price signal. (For further information, refer to our *Annual Energy Conservation Progress Report – 2009 (Volume Two)*).

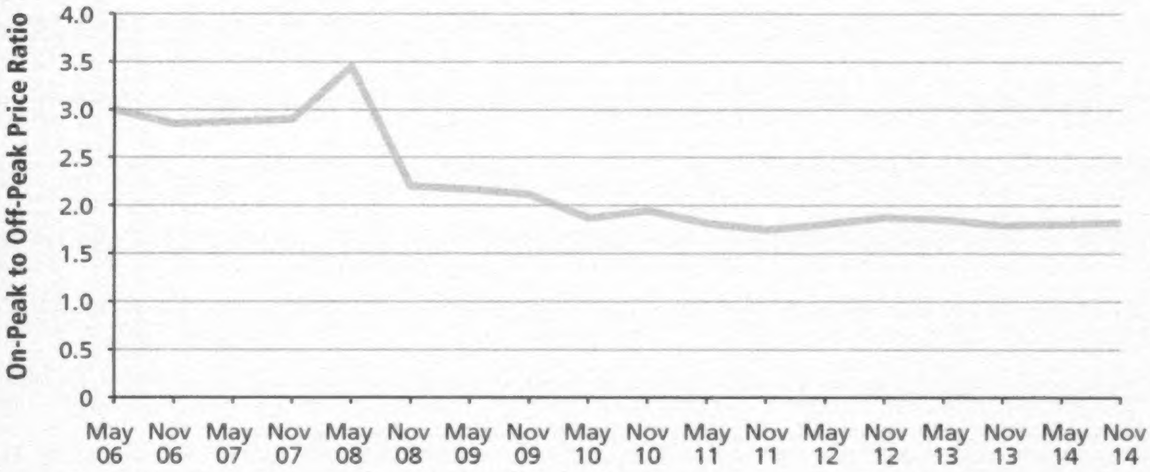


Figure 13: Ontario's On-Peak to Off-Peak Electricity Price Ratio

Source: Ontario Energy Board

Increasing the price differential would not mean that all customers receive higher bills. In the near term, some bills would be higher and some would be lower. Certain customers (for example, many small businesses) could face higher bills because they use more of their electricity at peak times. Therefore, it is important to ensure that targeted conservation programs (such as the existing Direct Install Lighting Program) are in place to help these customers reduce their peak electricity use. Over a longer period, there would be net savings for most customers if the drop in peak demand allows Ontario to avoid new generation or transmission investments.

In addition, the 2013 Long-Term Energy Plan includes TOU rates as a way to reduce peak demand. As such, the ECO believes that now is an ideal time to increase Ontario's on-peak to off-peak price ratio. Evidence from other jurisdictions indicates a higher ratio can result in even more peak demand savings. Since Ontario has had some success with a weak price ratio, a wider differential could encourage stronger consumer response to capitalize on this modest achievement.

The rationale for increasing the on-peak to off-peak price ratio is clear: a larger price ratio can encourage larger peak demand savings. The ECO believes that the OEB's planned review of the RPP, including TOU rates, should examine how Ontario can use its TOU policy to maximize energy conservation and greenhouse gas emission reductions, as well as to avoid future infrastructure spending. This would likely require the Board to widen the on-peak to off-peak price ratio; either pro-actively or under direction from the Ministry of Energy, reflecting Ontario's "conservation first" electricity policy.

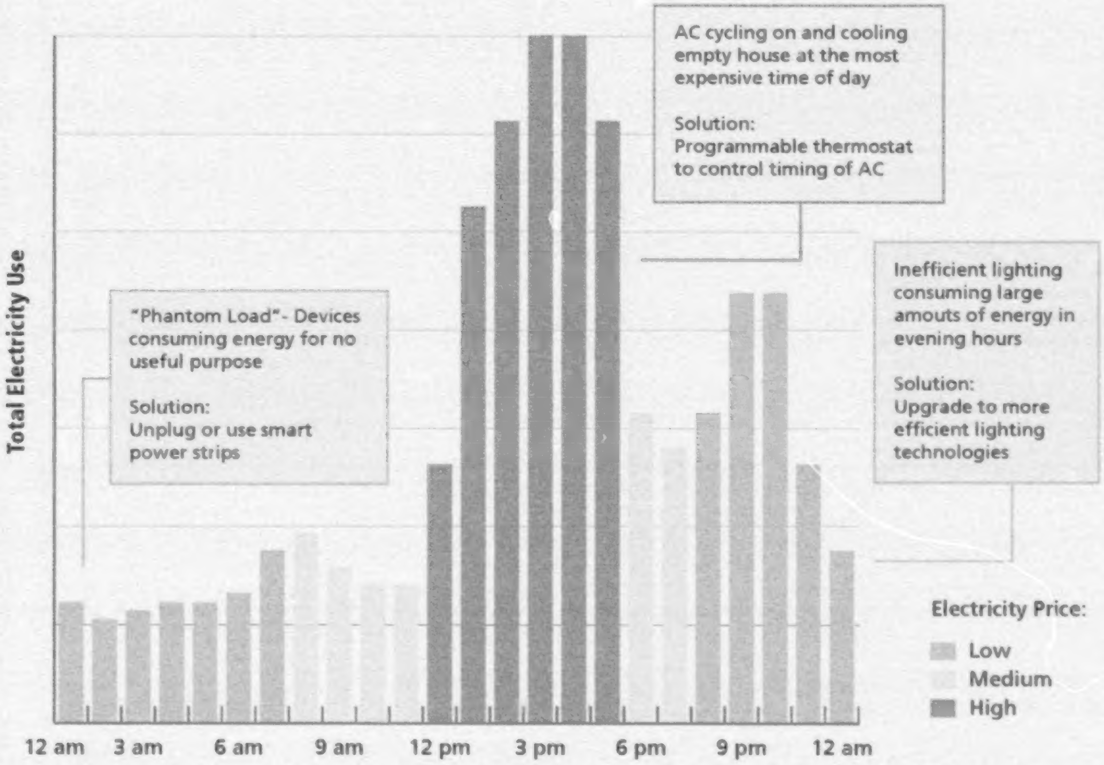
The ECO recommends that the Ontario Energy Board significantly widen the peak to off-peak price differential.

Finally, the report prepared for the OEB noted that surveys of customer behavior and attitudes can improve the analysis of Ontario's TOU data. The ECO urges the government and its electricity agencies to complete such work in order to develop a robust understanding of customer response to TOU prices.

2.7.3.1 SPREADING THE WORD: INCREASING ACCESS TO INFORMATION ON ENERGY CONSERVATION IN ONTARIO

As a by-product of time-of-use (TOU) pricing, there is an opportunity to use the hourly data collected by smart meters to help consumers better understand their patterns of electricity use. After all, one of the best strategies to manage electricity consumption is to learn more about how it is used.

Smart meters provide local utilities with a wealth of information about household electricity consumption habits. In turn, utilities from across the province have developed online portals that allow individual customers to see their electricity usage. If a customer does not already have an account, or does not have access to the Internet, he or she can contact their local utility to find out more about how to access this information.



"Phantom Load"- Devices consuming energy for no useful purpose

Solution:
Unplug or use smart power strips

AC cycling on and cooling empty house at the most expensive time of day

Solution:
Programmable thermostat to control timing of AC

Inefficient lighting consuming large amouts of energy in evening hours

Solution:
Upgrade to more efficient lighting technologies

Figure 14: An Illustrative Example of Hourly Electricity Consumption Data

Source: Environmental Commissioner of Ontario

The ability to download historical TOU information is being standardized through something called the "Green Button." The Green Button was created in the U.S. in 2011 and provides consumers with their own electricity data in a standard, user-friendly format. Consumers can then share the data with mobile and web-based apps to help manage their use of power. In 2012, the Minister of Energy created a working group to look at a Green Button program. By spring 2013, under the management of Ontario's MaRS Discovery District, a Green Button implementation standard was developed for the province. Over 60 per cent of Ontario consumers can download their data, and this number is expected to increase as more utilities adopt the Green Button standard.[137]

Automatically sharing Green Button data through local utilities with third party apps or service providers is referred to as "Connect My Data." The promise of third party apps is that they may find ways to make energy conservation easier or more engaging for casual users, eliminating the need for customers to do their own data mining. Third party programs can also combine smart meter data with other information (e.g., weather conditions, electricity generation statistics) to offer additional value. There are currently two pilot Connect My Data programs being operated by London Hydro and Hydro One; a final report on these pilots will be provided by researchers located at MaRS to the Ministry of Energy by September 2015, together with a Connect My Data implementation guide for local distribution companies.[138]

The Ministry of Energy sponsored the 2013 Energy Apps for Ontario Challenge to expand the possibilities for Connect My Data services. The challenge launched in October 2013 to find "the best new, proof-of-concept apps that [will] help Ontarians unlock the potential of Green Button-enabled electricity data."[139] The contest offered $50,000 in prize money – including a grand prize of $20,000 – and attracted wide interest. There were 27 submissions (24 from within Ontario and 3 from the U.S.), and 6 apps were created by university and college students. The winning apps may be used in pilot programs run by London Hydro and Hydro One.[140]

Other 2013 activities to improve customer engagement included:

- the launch of the government's emPOWERme website (www.energy.gov.on.ca/en/empowerme) to enhance energy literacy using videos and graphics to teach concepts like electricity generation and conservation; and
- a revamped Independent Electricity System Operator website that makes it easier to find information.

The ECO encourages the Ministry of Energy to evaluate and report on consumer response to the Green Button, Connect My Data services, and the use of energy apps.

2.7.4 INDUSTRIAL CONSERVATION INITIATIVE (LARGE CONSUMERS)

The Ministry of Energy launched the Industrial Conservation Initiative (ICI) in January 2011. The ICI changed how the Global Adjustment is calculated for large electricity consumers in Ontario (see Section 2.7.4.2). Previously, all electricity consumers had their Global Adjustment calculated based on the total monthly volume of electricity used (as a per kilowatt-hour charge). But as of January 2011, Class A customers (mainly industrial electricity customers with an average monthly demand of five megawatts or more) started to have their Global Adjustment payments based only on the electricity used during the five highest peak hours over 12 months. These so-called "High-5" hours must occur on five different days of the year. All other Ontario customers (designated as Class B) continue to see the Global Adjustment applied on a volumetric basis.

The ICI program gives a strong incentive to Class A customers to reduce consumption during all potential High-5 hours. For example, if Class A customers are responsible for 10 per cent of the total demand during High-5 hours, then they only pay 10 per cent of the Global Adjustment for the entire billing period, regardless of how much energy this group uses during all other hours.[141] Any outstanding Global Adjustment balance is passed on to Class B customers and added to the Global Adjustment amounts they pay. When introduced, the initiative was expected to reduce peak demand by 450 to 500 MW and eliminate over $400 million in capital costs.[142] As the exact timing of High-5 hours cannot be predicted with certainty, the program's impact was also anticipated to extend beyond the five peak demand days.

The ECO viewed the launch of the ICI as a positive step for energy conservation in Ontario (refer to our *Annual Energy Conservation Progress Report – 2010 (Volume One)*).[143] However, we highlighted some potential issues when the program was still in its infancy, including:

1. The ICI was only available for customers with an average monthly peak demand of at least 5 MW, so smaller customers did not have an opportunity to participate.
2. Global Adjustment costs may include some items that are not related to peak demand (as shown in Section 2.7.4.2), like payments for nuclear generation. Charging customers for these costs based on their peak load could be unfair, especially for customers with 'very peaky' loads.

The ECO suggested the program could be made available to more customers and some inequalities in the allocation of costs could be addressed.

Since the ECO's initial review, Ontario's ICI program has continued and been recently expanded. The following discussion provides a brief update on the initiative.

2.7.4.1 INITIAL PROGRAM RESULTS

According to the Ministry of Energy, the ICI decreased peak demand during High-5 hours by 575 MW in 2011, 875 MW in 2012, and 850 MW in 2013, which is about the capacity of a new natural gas power plant.[144, 145] These figures are based on information from Ontario's IESO.[146] To determine how much electricity is saved under the ICI, the IESO first calculates an average Class A profile (or "baseline") from June to mid-September in a given calendar year. The baseline is compared to Class A customers' actual consumption during High-5 hours. The differences between actual consumption during High-5 hours and the baseline are then averaged to estimate electricity savings from the ICI.

There are some 200 ICI participants, which represent approximately 9.6 per cent of Ontario's peak demand, but about 17 per cent of Ontario's total electricity consumption.[147] Class A consumers are automatically enrolled in the ICI and have the choice to opt-out and become Class B consumers. To date, only a relatively small number of consumers have opted out, likely because they could not easily reduce peak demand.

Difficulty Tracking Energy Savings

While there is a way to estimate energy savings attributable to the ICI program, accurate evaluation is a challenge because it involves measuring something that *did not* happen (i.e., electricity that was not used). In addition, there are other variables besides the ICI program that may contribute to peak reduction, influence the occurrence of the High-5 hours or affect the savings derived from the ICI (e.g., other demand reduction and conservation programs, and market conditions).

For example, the IESO's estimate of peak demand reduction may be an overestimate because it ignores the potential response of ICI participants to the market price of electricity. In the absence of the ICI, customers may have already reduced their consumption (although likely not to the same degree) during the High-5 hours because the market price of electricity would be higher during these hours.

In addition, the ICI operates alongside other energy conservation programs, and it can be difficult to attribute savings that arise solely from this program or another. As a result, participants could be compensated more than once for the same megawatt savings. For example, the OPA's Demand Response 3 program pays customers to conserve energy during times of high demand. So if a customer participating in both Demand Response 3 and the ICI reduces its consumption by 100 MW – compared to what it would have consumed in the absence of these programs – during an hour when Demand Response 3 has been activated, it would receive both a Demand Response 3 payment and a discount on its Global Adjustment charges from the ICI. In addition to providing multiple incentives for the same peak demand reductions, the electricity saved in this situation would also be overestimated or "double-counted" (e.g., savings would be counted under Demand Response 3 and under the ICI).[148] Such overestimation adds uncertainty when reporting and verifying the progress made toward energy conservation targets.

2.7.4.2 THE GLOBAL ADJUSTMENT – ONLY IN ONTARIO

In theory, the wholesale market price in Ontario varies throughout the day to reflect the cost of electricity generation. Prices should be lower when baseload hydroelectric and nuclear are able to meet Ontario's energy needs, and prices should be higher when more expensive options – like peaking natural gas plants – are required.

Unfortunately, the wholesale market price is inadequate for new generators to recover their fixed capital costs. So, to ensure that investments in new and refurbished generation are viable, almost all electricity generators are provided support payments through the Global Adjustment. The Global Adjustment accounts for the differences between the market price and the rates paid to contracted generators and regulated generators (as well as payments for conservation programs). It is a variable monthly charge or credit, depending on market conditions.

The Global Adjustment was originally applied as a flat rate to all consumers based on the volume of electricity used, regardless of when the electricity was used. This policy for very large customers was changed with the creation of the Industrial Conservation Initiative (ICI). As discussed in this section, many of Ontario's largest electricity customers are participating in this incentive program; as a result, it is worthwhile to reflect on the underlying Global Adjustment charge that the ICI is designed to influence.

Almost all electricity generators receive support payments of some type through the Global Adjustment – as shown in Figure 16 – yet this item remains a complex and obscure factor on electricity bills. The Ontario Power Authority and the Independent Electricity System Operator (IESO) have each created websites to explain what this charge represents. As outlined on the OPA's site, the Global Adjustment is calculated based on the following formula:

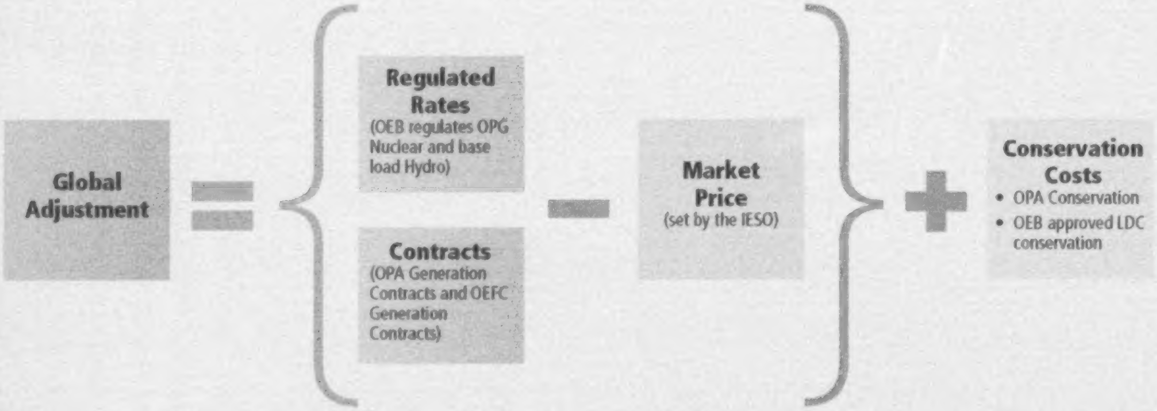

Global Adjustment
Regulated Rates
(OEB regulates OPG Nuclear and base load Hydro)
Contracts
(OPA Generation Contracts and OEFC Generation Contracts)
Market Price
(set by the IESO)
Conservation Costs
• OPA Conservation
• OEB approved LDC conservation

Figure 15: An Illustrated Definition of the Global Adjustment

Note: OEFC is the Ontario Electricity Financial Corporation

Source: Ontario Power Authority

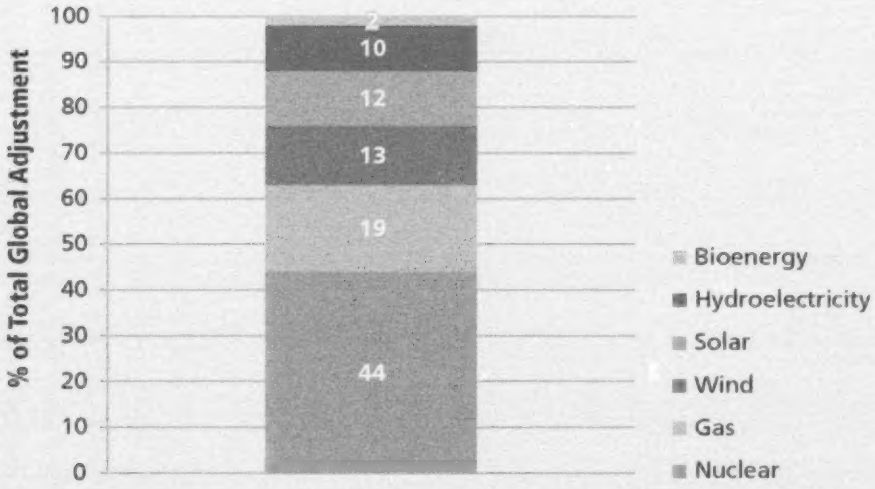


Figure 16: Estimated Components of the Global Adjustment by Technology Type for November 2014 – October 2015

Note: The total Global Adjustment is estimated to be $9.6 billion between November 1, 2014 and October 31, 2015. The above data is taken directly from the Ontario Energy Board's Regulated Price Plan Report. This data did not explicitly show how energy conservation contributes to the Global Adjustment. However, as the ECO has noted in Section 3.3 of this report, energy conservation accounts for about 3 per cent of the total Global Adjustment. Hydroelectricity excludes non-utility generators and OPG non-prescribed generation. Gas includes Lennox and non-utility generators.

Source: Ontario Energy Board

All else being equal, consumers will generally reduce demand when prices are higher and increase demand when prices are lower. A properly functioning commodity market sends logical price signals to consumers. However, recent years have seen an increase in the amount of the Global Adjustment as it compares to the Hourly Ontario Energy Price (HOEP) (as shown in Figure 17). Given that the Global Adjustment reflects the difference between contracted costs (generation and conservation) and market revenues reflected through the HOEP, the Global Adjustment has continued to rise, while the HOEP has generally decreased.

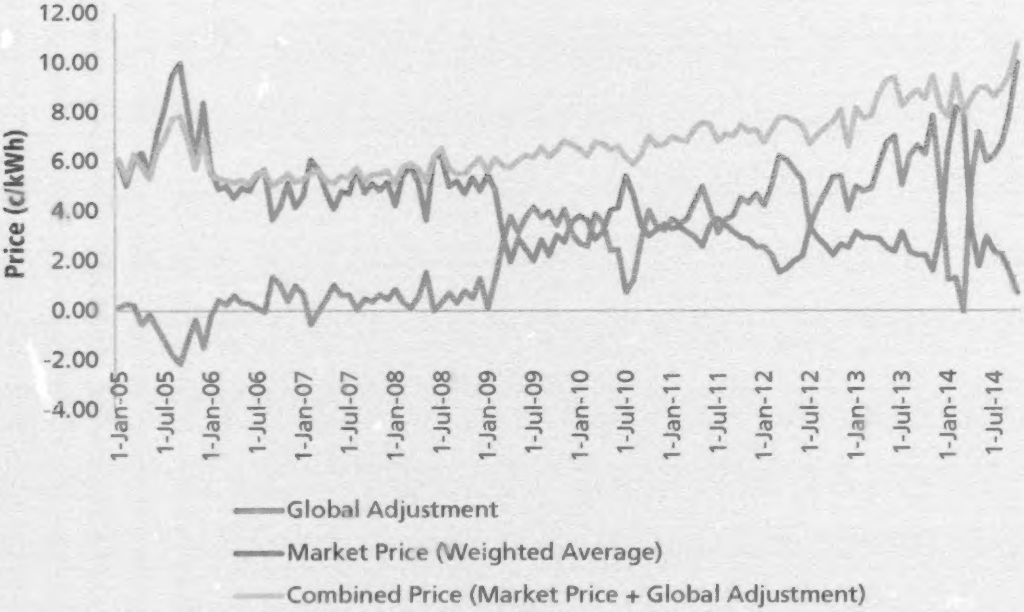


Figure 17: Wholesale Electricity Price and Global Adjustments in Ontario, 2005 - 2014

Note: The unseasonably cold weather during the winter of 2013/2014 increased electricity demand and consequently increased the market price for electricity. This higher price caused a noticeable spike in the market price; it met some of Ontario's contractual costs for electricity generation and dramatically decreased in the Global Adjustment price. From 2011 onwards, the Global Adjustment price is for Class B customers only, since Class A rates vary from consumer to consumer.

Source: Independent Electricity System Operator

As the Global Adjustment has become a larger portion of the total electricity cost, the ICI incentive for Class A customers to reduce their consumption has grown, as has the resultant impact on the electricity bills of those Class B customers who cannot participate in the ICI. In 2013, the ICI transferred approximately $500 million in costs from Class A customers to Class B customers, raising their bills by roughly 0.4 cents/kWh.[149] The IESO recently hired Navigant Consulting Ltd. to review the Global Adjustment and to look for other North American jurisdictions with a similar charge. While they did uncover a variety of different market frameworks that exist elsewhere to help recover electricity supply costs, Navigant could not find one of equivalent structure and scale to Ontario's Global Adjustment. (More information can be found in their report).[150]

Fitting the ICI into Ontario's Conservation Future

There is momentum behind the ICI program. The 2014 Budget announced the threshold for Class A consumers would be lowered from 5 MW to 3 MW, thus capturing more consumers for the ICI program. In May 2014, a subsequent amendment to O. Reg. 429/04, under the *Electricity Act, 1998*, lowered this threshold for certain types of industries, allowing prescribed customers with an average peak demand of 3 MW to 5 MW to opt-in to the program. It should be noted that the amendment was not posted on the Environmental Registry and, as a result, the Ministry of Energy did not allow for broad stakeholder comment or post a decision notice explaining the government's consideration of any comments received.[151] By not automatically enrolling eligible, mid-sized customers into ICI, the program respects the fact that these smaller companies may have a limited level of energy management expertise. The Ministry of Energy noted that the 3 MW eligibility threshold "strikes an appropriate balance between providing long-term electricity system benefits and respecting ratepayers in the short term" and that a lower threshold for ICI participation would introduce greater administrative costs for LDCs.[152] The ECO requested information on how the expansion of the ICI program would impact the price of electricity for smaller electricity customers, but the ministry would not provide this analysis.[153]

ECO Comment

Results from the ICI program are now becoming available. So, is the initiative working? The short answer is yes. The Ministry of Energy reports that electricity savings from the ICI were 850 MW in 2013.[154] The ECO makes two observations. First, the ECO is encouraged to see that large customers are indeed engaged in energy conservation. Second, the ECO notes that tracking the exact amount of savings achieved under the ICI is difficult because Ontario's current method does not properly account for the overlap between the ICI and other demand response programs. The ECO is thus skeptical of the accuracy of any estimate of the electricity saved as a direct result of the ICI program.

Encouraging Initial Results

Initial results show large customers are engaged, conserving electricity during High-5 hours. The relatively modest savings of 575 MW achieved in 2011, were followed by more substantial amounts in 2012 (875 MW) and 2013 (850 MW). Although three data points do not confirm a definite trend, large customers appear to have become more familiar with the program over time and, hence, its effectiveness is growing. Since this is still a fairly new conservation program, the impact of the program will likely continue to increase as customers gain even more experience with adjusting their electricity use during critical peak times. Furthermore, the program will provide extra savings in future years as certain smaller customers are allowed to participate. Expanding the program – and critical peak pricing – to a larger number of customers addresses one concern from our *Annual Energy Conservation Progress Report - 2010 (Volume One)*.[155]

The evolution of the program's performance should be closely monitored. It is uncertain how the ICI program will perform in the future, and this may have an impact on Ontario's long-term energy plan. If the province should face a future electricity supply shortage (e.g., if demand increases or unexpected delays in nuclear refurbishment materialize), the value of peak demand reduction would be even more important. At the same time, however, the Global Adjustment charge during peak times would be expected to be lower and the wholesale market price higher. Thus, the ICI's incentive to reduce peak demand would be reduced making it less attractive to Class A participants and possibly less effective. In addition, it may become increasingly more difficult to anticipate when Ontario will experience a peak High-5 hour given the growing amount of embedded renewable generation in Ontario's electricity system.

Tracking Savings Needs to Improve

Other programs, like Demand Response 3, already exist and have contracts in place to deliver electricity savings during peak times. Unfortunately, when the ICI and Demand Response 3 overlap, the resultant savings cannot be easily separated and reliably attributed to one or the other program. While future program rules are expected to remove the issue of double-payment,[156] those new rules would not apply retroactively. Between 2011 and 2013, Demand Response 3 was active for 4 of 15 separate High-5 hours suggesting some (though not excessive) amounts of double-payment may have occurred.[157]

The issue of overlap between the ICI and Demand Response 3 is also important for tracking and verification purposes. Ontario has established a target to reduce peak demand in 2025 by 10 per cent through demand response initiatives, including the ICI and Demand Response 3 (see Section 2.3). To accurately measure progress toward this target, there should be a methodology that correctly adds the impact of different initiatives together by assessing their joint contribution to reducing peak demand, measured during the same hours. It is also likely that the combined peak demand reduction of the ICI and Demand Response 3 together is less than the sum of the individual effects from these two separate programs.[158] The ECO notes that going forward, as the IESO takes over responsibility for demand response, it intends to structure a demand response auction and rules to take into account ICI participation.[159] This would potentially resolve the concern of double payments to participants in both programs, while also making it easier to accurately measure overall progress toward Ontario's 2025 peak demand reduction target. The ECO supports this direction.

Overall, the ECO remains concerned about whether the ICI has achieved peak demand reduction at too great a cost to non-participants. As the Global Adjustment cost has risen, this concern is more relevant today than it was three years ago (see the ECO's *Annual Energy Conservation Progress Report – 2010 (Volume One)*). As the ECO previously noted, this concern could be addressed in two ways: (1) by making more customers eligible for the ICI or (2) by reducing the amount of the ICI incentive.[160] While the ministry's expansion of the ICI program to customers using between 3 MW and 5 MW enables greater participation in the ICI, it will raise costs for customers below the 3 MW threshold who remain ineligible.

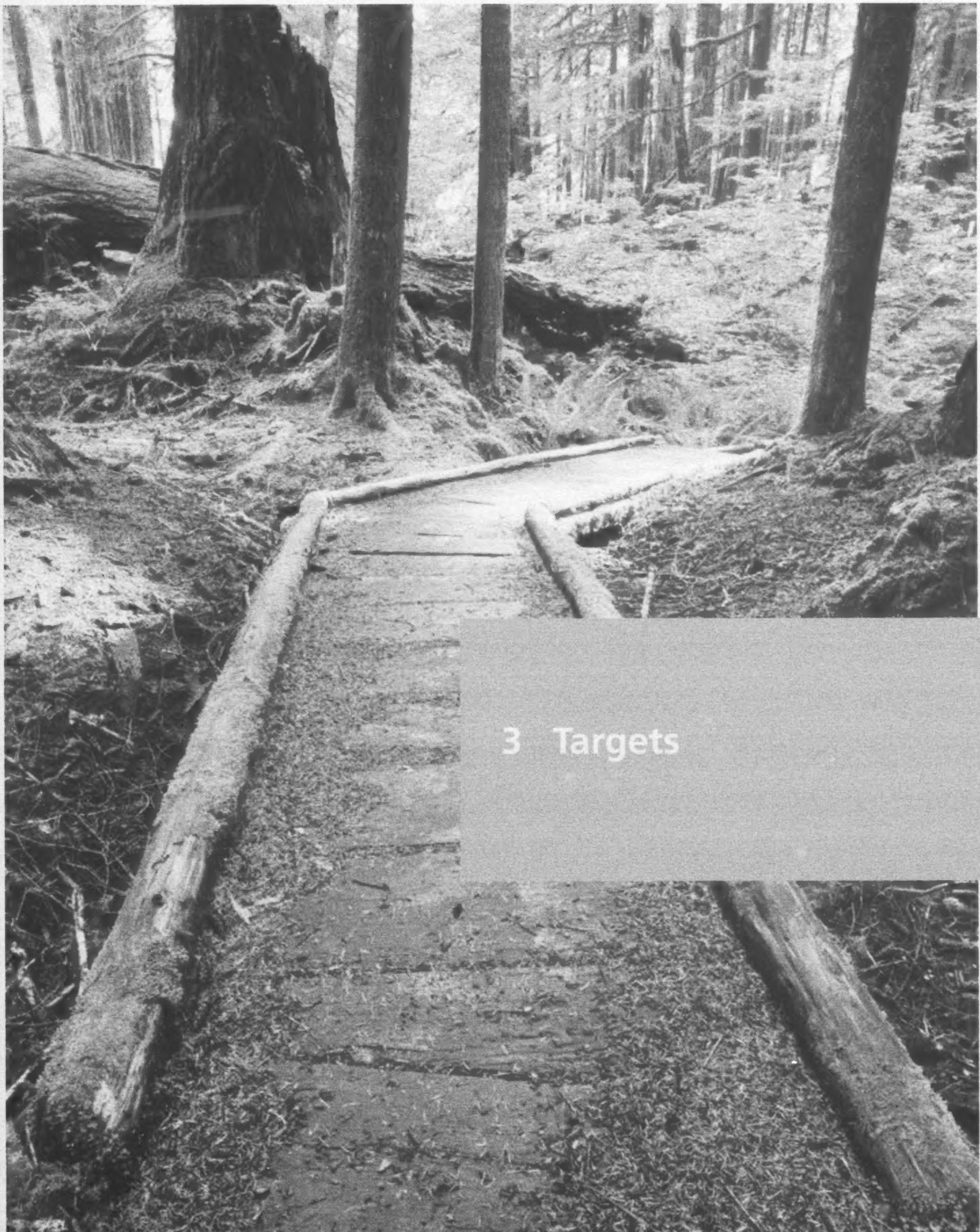
Improving Electricity Pricing for all Ontario Customers

Ontario's current pricing policies are due, in part, to technological factors: TOU pricing is limited to RPP customers because smart meters were only mandated for these customers; and the size threshold for the ICI was chosen due to the presumed greater ability of these customers to monitor and adjust their energy usage. The ECO notes that, with smart metering now in place for all RPP customers, and the decision to expand interval metering to all other customers, Ontario will have the ability to measure consumption for all electricity customers on an hourly basis. This provides an opportunity to look holistically at pricing strategies for all classes of Ontario electricity customers, including RPP customers, Class A customers, and the "in-between" group that uses too much electricity to qualify for the RPP, but too little to be eligible for the ICI.

Pricing policy for one group of customers directly or indirectly impacts the pricing policy for other groups. For example, the transfer of Global Adjustment costs increases costs for all Class B customers and affects Ontario's TOU rates. It is likely that this impact has made the government less amenable to increasing the on-peak to off-peak price ratio, as RPP customers with little opportunity to reduce peak demand face a price increase from both policies.

As the ECO has shown, pricing structures for different customer classes have evolved differently; somewhat ironically, the incentive for large electricity customers to shift their consumption away from peak hours may be too great, while the incentive for smaller customers to shift consumption may be too little. The ECO believes that the OEB should consider the inter-relationships in pricing between different customer classes as part of its review of the RPP in order to avoid policy inconsistency. In order to avoid policy inconsistency, the ECO believes that the OEB should consider the inter-relationships in pricing between different customer classes as part of its review of the RPP. Specific goals should include achieving fairness across customer classes, managing system costs by encouraging conservation and peak demand reduction, and reducing environmental impacts.

The ECO recommends that the Ministry of Energy lead an integrated review of the electricity pricing structure for fairness and conservation.



3 Targets

3.1 UPDATE ON GOVERNMENT-ESTABLISHED ENERGY TARGETS – 2013

Government-Established Targets

The ECO's mandate includes reporting on Ontario's progress in meeting government-established targets to reduce or make more efficient use of energy. The ECO considers "government-established targets" to result from either a formal government policy or a minister directing activities that specify an amount of energy to be conserved.[161] To date, the ECO has completed a detailed analysis of progress towards most of these targets, and references have been provided in various summary tables to direct the reader to the location of the analysis.

The tables in this section provide an overview of progress towards government-established energy targets for the 2013 reporting year.

3.1.1 A GUIDE TO THE TABLES ON GOVERNMENT TARGETS

Table 6 outlines the energy targets that are specifically set for government ministries. It is each ministry's responsibility to meet its respective target. While all targets are important, some influence activities across the entire province, while others influence activities internal to government.

Table 7 summarizes the active electricity conservation targets in Ontario contained in the 2013 Long-Term Energy Plan (LTEP), directives issued to the Ontario Energy Board (OEB) and directions to the Ontario Power Authority (OPA). As a result of policy development in 2013, the targets contained in the 2010 Long-Term Energy Plan and 2011 Supply Mix Directive are no longer in effect and have been superseded by new targets contained in the 2013 Long-Term Energy Plan. Previous ECO reports can be consulted for details on these targets.

Table 8 summarizes new targets for energy storage and industrial energy conservation that were established as a result of procurement directions from the Minister of Energy to the OPA. (Other previous procurement directions, which contribute to the performance targets in Table 7, are also noted below the table).

Targets for Natural Gas

Ontario's two large natural gas utilities (Enbridge Gas Distribution and Union Gas) have annual performance targets for their conservation activities, and progress on these targets is summarized in Section 3.2. While these targets are not "government-established targets," the ECO also reports on them to provide a more complete understanding of the state of energy conservation in Ontario. Each utility has targets for its three major categories of conservation programs: (1) resource acquisition programs focused on direct energy savings; (2) programs for low-income customers; and (3) market transformation programs (focused on facilitating fundamental changes that lead to greater market shares of energy-efficient products and services).

Table 6: Summary of Government-Established Energy Targets for Ministries

Provincial Targets		
Target		Progress on Target
Initiative	Premiers' agreement at the 2008 Council of the Federation	Progress on the target is undetermined as the ministry has still not provided the methodology to measure progress against the 20% target. The following new initiative was taken in 2013 to increase Ontario's energy efficiency: Ontario's minimum energy efficiency regulation, O. Reg. 404/12, was amended to set new or update standards and/or test methods for 25 products (7 of which were newly regulated products). The amendments took effect January 1, 2014. With these additions, the province currently regulates a total of 81 products. The provinces are working to develop a new Canadian Energy Strategy, which is expected to be finalized in 2015. It is unclear whether the new Strategy will include energy efficiency targets.
Description	20% energy efficiency improvement in Ontario by 2020.	
Responsibility to address	Ministry of Energy	
Date announced	2008	
Completion date	2020	
ECO Report Section	2009 (Volume Two, Section 3.1)	
Initiative	Low Carbon Fuel Standard	Little measurable progress towards this target has been made. To a substantial degree, all of the issues identified previously by the ministry[162] remain evident. The ministry continued to monitor California's implementation of its Low Carbon Fuel Standard. The ministry took no actions in 2013 to establish a Low Carbon Fuel Standard in Ontario.
Description	10% reduction in carbon intensity from transportation fuels by 2020.	
Responsibility to address	Ministry of Energy	
Date announced	2007	
Completion date	2020	
ECO Report Section	2009 (Volume Two, Section 3.5)	
Initiative	Electric vehicle purchases	As of December 31, 2013: 1,574 purchase incentive grants have been issued for electric vehicles under the Electric Vehicle Incentive Program. During 2013: 262 home charging station rebates were issued under the electric vehicle Charging Incentive Program which was launched on January 1, 2013. As of December 31, 2013: 1,862 green licence plates have been issued. No end date to the Electric Vehicle Incentive Program has been publicly announced, yet the $63 million in funding for the program is only earmarked until March 2016. GO Transit/Metrolinx is operating a pilot program to test EV charging capacity at 10 GO Transit stations. In the first phase of a two-phase pilot, two parking spaces with charging capacity have been installed at each of the following stations: Ajax, Aurora, Burlington, Centennial, Clarkson, Erindale, Lincolnville, Oakville, Pickering and Whitby.
Description	1 in 20 vehicles driven in Ontario by 2020 to be an electric vehicle.	
Responsibility to address	Ministry of Transportation; Ministry of Economic Development, Employment and Infrastructure; Ministry of Energy	
Date announced	2009	
Completion date	2020	
ECO Report Section	2009 (Volume Two, Section 3.6)	

Provincial Targets		
Target		Progress on Target
Initiative	Education sector energy consumption reduction	The Utility Consumption Database was launched in August 2009. The Database started collecting electricity and natural gas consumption data[163] in the 2010 fiscal year, the baseline year of September 1, 2009 to August 31, 2010. (School boards' fiscal year runs from September 1st to August 31st). The provincial average energy intensity[164] for the sector was: 0.76 gigajoules per square metre in fiscal year 2011 0.68 gigajoules per square metre in fiscal year 2012 0.71 gigajoules per square metre in fiscal year 2013
Description	Establishment of a database to gather energy consumption data and set benchmarks.	
Responsibility to address	School boards assisted by the Ministry of Education	
Date announced	2008	
Completion date	Not applicable	
ECO Report Section	2011 (Volume Two, Section 4.0)	
Initiative	Ontario Public Service energy consumption reduction	The Ontario Public Service is tracking its progress toward its 19% greenhouse gas (GHG) reduction target by the end of 2014/15. Refer to the endnote section of this report for quantitative, year-over-year results.[165] Interim progress against the 2006 baseline is as follows: For vehicle fuel consumption, the government has reduced its GHG emissions by 18.1%. For air travel, the government has reduced its GHG emissions by 18.2%. For energy use in government buildings, the government estimates it has reduced its GHG emissions by 30.1%.
Description	Part 1: Annual reduction of 5% for the period 2009-2014 in each of vehicle fuel consumption, air travel, and energy used in government buildings. These annual targets are part of the Ontario Public Service goal to reduce its GHG emissions by 19% by 2014/2015, compared against a 2006 baseline. Part 2: Reduce GHG emissions from the Ontario Public Service by 27% by 2020/2021, compared against the 2006 baseline.	
Responsibility to address	Treasury Board Secretariat	
Date announced	2009	
Completion date	Part 1: March 31, 2015 Part 2: March 31, 2021 [166]	
ECO Report Section	2009 (Volume Two, Section 4.7)	
Initiative	Electricity conservation in Ontario government operations	Government achieved 80% of its 2007 target. As verified by an independent third party, the government achieved 100% of its 2012 target. Specifically, the government reduced its electricity consumption by 21%[167] from the 2002/2003 baseline, and thus exceeded its 20% by 2012 target.
Description	A two-step target measured against a baseline of 2002/03 electricity use: a 10% reduction in the government's own electricity use by 2007, and an additional 10% by 2012.	
Responsibility to address	Ministry of Economic Development, Employment and Infrastructure with assistance from Infrastructure Ontario	
Date announced	2004 and 2007	
Completion date	2007 and 2012	
ECO Report Section	2010 (Volume Two, Section 2.3.2)	

Table 7: Summary of Government-Established Provincial Electricity Conservation Targets for the Ministry of Energy, OPA, LDCs and IESO

Provincial Targets		
Target		Progress on Target
Initiative	Province-wide electricity conservation target contained in the 2013 Long-Term Energy Plan.	8.716 TWh of energy savings as of year-end 2013 (29% of 2032 target).
Description	A 30 terawatt-hour (TWh) reduction of electricity consumption in 2032 due to conservation efforts from 2005 onwards.[168]	
Responsibility to address	Ministry of Energy	
Date announced	December 2013	
Completion date	2032	
ECO Report Section	2014 (Section 2.3)	
Initiative	Province-wide demand response target contained in the 2013 Long-Term Energy Plan.	Effective March 31, 2014: ▪ The OPA will not execute any new or renew any existing Demand Response 2 contracts. ▪ Any Demand Response 3 contracts that the OPA executes or renews must mature by March 31, 2015. ▪ Any existing Demand Response 3 contracts maturing after March 31, 2015 will be terminated without penalty. ▪ In the first quarter of 2015: ▪ All Demand Response 3 contracts held by the OPA will be transitioned to a new IESO Demand Response transitional market.
Description	Use Demand Response to meet 10% of peak demand in 2025. Procure an expected total of 2,400 MW under current forecast projections. Demand Response will include peak reduction amounts from demand response programs for large industrial and commercial consumers, aggregated Demand Response from small and medium industrial and commercial consumers, residential Demand Response (e.g., *peaksaver* program), pricing strategies such as time-of-use rates and the Industrial Conservation Initiative.	
Responsibility to address	Independent Electricity System Operator	
Date announced	December 2013	
Completion date	2025	
ECO Report Section	2014 (Section 2.3)	

Provincial Targets

Target		Progress on Target
Initiative	Conservation and Demand Management Directive for electricity distributors for the period 2011-2014.	639 MW expected to persist until 2014, as of year-end 2013 (48% of 2014 peak demand target).[169]
Description	1,330 MW of provincial peak demand reduction persisting at the end of the four-year period, and 6,000 GWh of reduced electricity consumption accumulated over the four-year period. Distributors were allocated a share of the province-wide target and are required to submit annual reports on progress to the Ontario Energy Board. Achievements contribute to, but are measured separately from Long-Term Energy Plan targets (which also include savings from codes & standards, pricing policy, and non-OPA/LDC programs).	5,139 GWh of cumulative energy savings achieved as of year-end 2013 (86% of 2011-2014 energy target).
Responsibility to address	Local Distribution Companies, with oversight by the Ontario Energy Board.	
Date announced	March 2010	
Completion date	2014	
ECO Report Section	2011 (Volume Two, Section 3.2)	
Initiative	2015-2020 Conservation First Framework direction to the Ontario Power Authority	Counting of savings will begin in January 2015.
Description	7 TWh of electricity reduction in 2020, due to conservation activities between January 1, 2015 and December 31, 2020 Distributors were allocated a share of the province-wide target and are required to submit conservation plans to the Ontario Power Authority. Achievements contribute to the province's conservation target of 30 TWh by 2032, as set out in the 2013 Long-Term Energy Plan (which also includes savings from codes & standards, and other programs not delivered by LDCs and the OPA).	
Responsibility to address	Local Distribution Companies, with oversight by the Ministry of Energy/Ontario Power Authority	
Date announced	March 2014	
Completion date	December 31, 2020	
ECO Report Section	2014 (Section 2.4)	

Table 8: Summary of Selected Procurement Directions*

Provincial Targets		
Target		Progress on Target
Initiative	Energy Storage	IESO procured 33.54 MW of storage for ancillary services to support system reliability. OPA is in the process of contracting for the remaining amount.
Description	50 MW of energy storage capacity, as specified in the 2013 Long-Term Energy Plan. As indicated in the March 2014 direction to the OPA and IESO: Phase 1: IESO-led procurement for as much as 35 MW of storage. Phase 2: OPA-led procurement, coordinated with the IESO, for the balance of capacity required to meet the 50 MW target.	
Responsibility to address	Independent Electricity Market Operator and Ontario Power Authority	
Date announced	December 2013 and March 2014	
Completion date	2014	
ECO Report Section	2014 Section 2.3	
Initiative	Industrial Accelerator Program	57.1 GWh of electricity savings (at the generator level) as of year-end 2013. The updated program will commence on June 23, 2015.
Description	1.7 TWh of electricity savings from transmission-connected customers by the end of 2020. The program helps transmission-connected electricity users to make capital investments in major energy efficiency projects.	
Responsibility to address	Ontario Power Authority	
Date announced	July 25, 2014	
Completion date	December 31, 2020	
ECO Report Section	Not Applicable	

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* The OPA funds programs that contribute to provincial targets, based on procurement authority of four directions from the Minister of Energy (directions for demand response programs, OPA-LDC conservation programs, a low-income conservation program, and an industrial conservation program). In addition, the OPA procures combined heat and power generation, which promotes more efficient use of energy through separate direction that authorized up to 1,000 MW of combined heat and power. At the end of 2013, the OPA had procured 472.2 MW of combined heat and power under this direction. These projects do not contribute to the provincial conservation targets.

ECO Comment

Ensuring Accountability

As shown in the tables, new targets were established in 2013 and previous targets were superseded by revisions. These are discussed in Section 2.3 of this report. The 2013 Long-Term Energy Plan (LTEP) cancelled the previous 2010 LTEP's targets. Accordingly, the ECO will not report on progress towards the previous LTEP's interim targets for 2015, 2020 and 2025 or its final target for 2030. While the ECO recognizes that there is merit in some flexibility to revise targets when conditions change, the ECO is concerned that this could threaten overall accountability, particularly if a pattern of behaviour develops where a ministry sets targets, makes revisions that nullify existing targets and abandons the targets well in advance of the date that they were to be adjudicated. This removes the requirement to assess performance in meeting the target, and determine accountability in cases where the target would not have been achieved.

Ministries shirking responsibility also threatens accountability. As stated in previous reports, the ECO remains concerned by the Ministry of Energy's continued efforts to ignore the need for a methodology to measure progress towards the Council of the Federation target set at the 2008 Council of the Federation meeting (Table 6). The ministry appears to have no intention of ever producing a methodology to measure progress towards the 20 per cent improvement target.

The ECO is also troubled by the Ministry of Energy's inaction on its 2007 commitment to establish a Low Carbon Fuel Standard regulation (Table 6). The ECO believes that the ministry's repetitious statement that it is monitoring California's efforts, while unlike California taking no action to resolve technical issues, is slowing adoption of low-carbon fuels in Ontario. Fewer years (6) now remain to meet the standard than have passed since the commitment was made (8 years) through a Memorandum of Understanding to cooperate with California on implementation. If the rationale for the Ministry's inertia is an analysis that a Low Carbon Fuel Standard is unworkable, it is time to publicly rescind the commitment and provide comparable carbon reductions through other transportation policies.

A further example is the Ministry of Transportation's interpretation of its target that 1 in 20 vehicles driven in Ontario in the year 2020 will be an electric vehicle. In previous years, the ministry has suggested that the target was an 'aspirational goal' not meant as a hard quantitative metric. The ministry's most recent interpretation of the electric vehicle target is that it is not a target or even a goal; it is, in fact, a program with no end date.[170] This after-the-fact revision of targets weakens accountability.

Finally, the ECO notes some slight changes were made to the government's internal greenhouse gas reduction target. The Ontario Public Service Green Office, which was created by the Ministry of Government Services in 2008 to help the government reduce its own environmental footprint, has worked over the last several years to ensure the government reduces its greenhouse gas emissions by 19 per cent by 2014, compared against a 2006 baseline. Yet for this year's report, the ECO learned that the Ontario Public Service Green Office was reorganized to fall under the oversight of the Treasury Board Secretariat, and it is working towards a target of a 19 per cent reduction in greenhouse gas emissions by March 31, 2015. Clarity at the outset of establishing targets is essential to maintain accountability, thus it is unfortunate that the target completion date was not made clearer when the target was originally set. Nevertheless, the ECO notes that good work is being made towards the government's internal target and the ECO will review this work next year, after the target date.

3.2 NATURAL GAS UTILITY CONSERVATION TARGETS

3.2.1 INTRODUCTION

In 2013, Ontario's two large natural gas distributors, Enbridge Gas Distribution and Union Gas, continued to offer conservation programs to their customers. Both utilities have a three-year plan (2012-2014) that describes the suite of conservation programs offered, the allowable budgets for each program, and the utility performance targets and incentives. Each utility developed its plan using the policy guidance of the Ontario Energy Board's *Demand Side Management Guidelines for Natural Gas Utilities*, and the plans were subsequently approved by the Board.[171] As 2013 is the middle year covered by these plans, the utilities made minor refinements and ramped up some of the new programs introduced in 2012, but did not make radical changes. An updated set of *Guidelines* for conservation programs for the 2015-2020 period is currently under development.

3.2.2 2013 PROGRAM RESULTS – PERFORMANCE AGAINST TARGETS

The 2013 conservation results for Enbridge Gas Distribution and Union Gas are shown in Table 9 and Table 10, respectively.[172] For each utility, actual 2013 program results are shown in comparison with the targets that were established in their three-year plans.[173]

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Conservation targets are established for each of the three categories of conservation programs that the utilities deliver.[174] As the utilities have gained more experience offering programs they first launched in 2012, new targets were added for 2013 that require a stronger commitment from program participants. For example, Enbridge's Home Energy Labelling program encourages realtors to include energy information on home listings at time of sale. The 2012 performance measure for this program was related to the number of realtors educated about home energy labelling. In 2013, a second target was added, for the actual number of home energy ratings that realtors included as part of their listings (a target that the Enbridge program missed badly). Similarly, Enbridge's Residential Savings by Design program for energy-efficient new homes now includes a target for the actual number of new homes built to higher-efficiency standards, not just the number of builders participating in the program.

Table 9: Summary of 2013 Performance Against Conservation Targets – Enbridge Gas Distribution

Program Type	Target Description	Progress on Target	Target Weight[175]
Resource Acquisition (58% of total budget)	972.6 million m^3 of lifetime natural gas savings, due to 2013 conservation programs (excluding low-income programs)	766.7 million m^3 of lifetime natural gas savings (79% of target)	92%
	Residential "deep" savings - 732 houses completing deep retrofits with at least two major conservation measures, and achieving natural gas savings of 25% or more (on average)	1,649 houses completed deep retrofits (225% of target)	8%
Low-Income (23% of total budget)	23.1 million m^3 of lifetime natural gas savings in single family homes, due to 2013 low-income conservation programs	32.9 million m^3 of lifetime natural gas savings (142% of target)	50%
	60 million m^3 of lifetime natural gas savings in multi-residential buildings, due to 2013 low-income conservation programs.	27.3 million m^3 of lifetime natural gas savings (46% of target)	45%
	40% of multi-residential buildings that participate in low-income conservation programs also participating in "Run it Right" program	85% of multi-residential buildings that participated in low-income conservation programs also participated in "Run it Right" program (213% of target)	5%
Market Transformation (19% of total budget)	Commercial Savings by Design program - 8 new developments enrolled in program for higher-performance design of new commercial/industrial/multi-residential buildings	16 new developments enrolled (200% of target)	11.6%
	Residential Savings By Design program - 14 of the top 80 volume residential homebuilders enrolled in program for higher-performance design of new low-rise residential buildings	18 of top 80 builders enrolled (129% of target)	27.2%
	Residential Savings By Design program - 900 new homes built to energy efficiency levels 25% higher than Building Code	967 new homes built to energy efficiency levels 25% higher than Building Code through program (107% of target)	18.1%
	Drain Water Heat Recovery program – 3,750 drain water heat recovery units installed in new homes	6,465 drain water heat recovery units installed (172% of target)	27.8%
	Home Labelling program - commitment from realtors responsible for at least 5,000 listings to include data field for energy rating information on home sale listings	Realtors responsible for 78,000 listings committed to including data field for energy rating information (1,560% of target)	10.7%
	Home Labelling program - 500 home energy ratings performed	138 ratings performed (28% of target)	4.6%

Source: Enbridge Gas Distribution, report, *2013 DSM Annual Report,* August 26, 2014.

Note: Red: < 75% of target; Yellow: 75-125% of target; Green: > 125% of target.

Table 10: Summary of 2013 Performance Against Conservation Targets – Union Gas

Program Type	Target Description	Progress on Target	Target Weight
Resource Acquisition Programs (52% of total budget)	853.1 million m^3 of lifetime natural gas savings, due to 2013 conservation programs (excluding low-income programs and programs for large-volume customers)	920.8 million m^3 of lifetime natural gas savings (108% of target)	90%
	Residential "deep" savings - 160 houses completing deep retrofits with at least two major conservation measures, and achieving natural gas savings of 25% or more (on average)	203 houses completed deep retrofits (127% of target)	5%
	Commercial/industrial "deep" savings – 10.4% reduction in gas consumption (on average) due to commercial/industrial custom conservation projects, compared with customer baseline	9.0% reduction in gas consumption for participants (87% of target)	5%
Low-Income Programs (26% of total budget)	26 million m^3 of lifetime natural gas savings in single family homes, due to 2013 low-income conservation programs	40.2 million m^3 of lifetime natural gas savings (155% of target)	60%
	17.6 million m^3 of lifetime natural gas savings in multi-residential buildings, due to 2013 low-income conservation programs	15.3 million m^3 of lifetime natural gas savings (87% of target)	40%
Market Transformation Programs (5% of total budget)	8 top residential homebuilders newly enrolled in Optimum Home program for higher-performance design of new low-rise residential buildings	8 new builders enrolled (100% of target)	60%
	30% of builders participating in Optimum Home program have built at least one prototype home	63% of participating builders have built at least one prototype home (210% of target)	40%
Large Volume Customer Programs (17% of total budget)	200.6 million m^3 of lifetime natural gas savings from rate T1 customers, due to 2013 conservation programs	180.4 million m^3 of lifetime natural gas savings (90% of target)	60%
	1,095.3 million m^3 of lifetime natural gas savings from rate T2/100 customers, due to 2013 conservation programs	1,664.2 million m^3 of lifetime natural gas savings (152% of target)	40%

Source: Union Gas, report, *Final Demand Side Management 2013 Annual Report*, November 4, 2014.

Note: Red: < 75% of target; Yellow: 75-125% of target; Green: > 125% of target.

The most important targets for utilities are the lifetime natural gas savings achieved from their suite of resource acquisition and low-income programs.[176] The amount of gas savings (divided by sector) that each utility achieved through its 2012 and 2013 conservation programs is shown in Figure 18. Gas savings from Enbridge's 2013 programs were lower than in 2012 for all sectors except the residential sector, and also much lower than Enbridge's 2013 targets. Enbridge noted that relatively low natural gas prices have caused some customers to focus their conservation efforts on projects that save electricity instead of natural gas. For the low-income program, a decision by Toronto Community Housing to temporarily halt its implementation of energy efficiency projects was partially responsible for the lower than expected results. Union Gas was more

successful and increased overall gas savings in 2013, with a large increase in savings from its programs for large volume-industrial customers, a more modest increase in savings from programs for commercial and residential customers, and a very slight decrease in savings from programs for low-income customers.

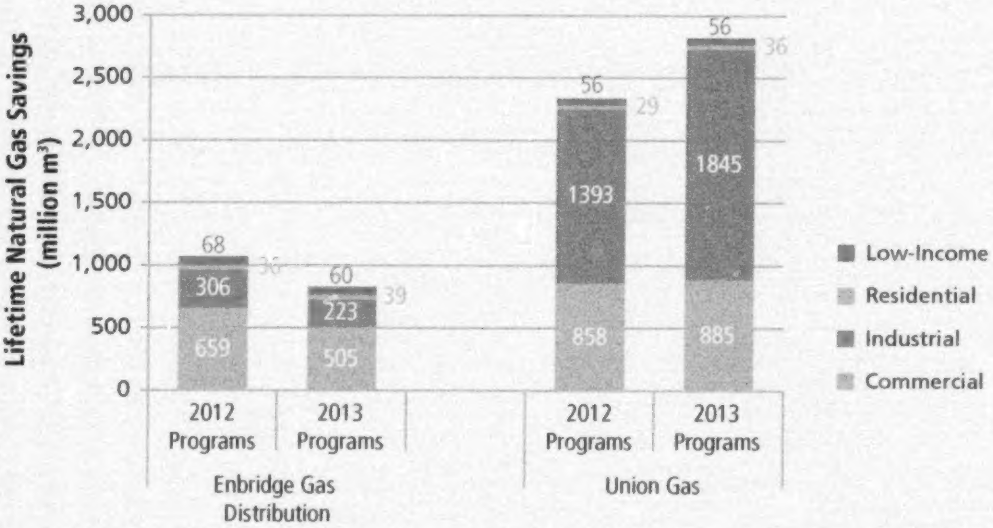
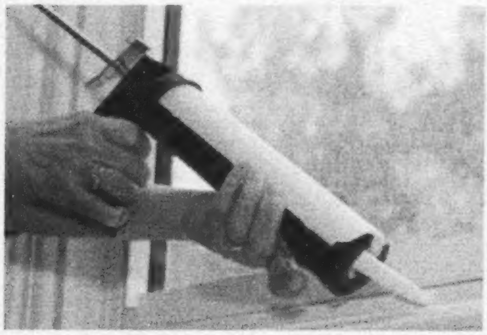


Figure 18: Lifetime Natural Gas Savings from 2012 and 2013 Utility Conservation Programs By Sector

Note: Only savings from large-volume industrial customers (rate classes T1, T2, and 100) are included in the "industrial" category for Union Gas. Savings for smaller industrial customers are included in the "commercial" category.

Source: Enbridge Gas Distribution, 2012 and 2013 Annual DSM Reports; Union Gas, 2012 and 2013 Annual DSM Reports



Each utility is eligible for performance incentives scaled to their performance against targets. Based on the 2013 results, the utilities will be eligible for $12.3 million in incentives ($4.5 million for Enbridge Gas Distribution and $7.8 million for Union Gas). This is a disappointing result for Enbridge, which was eligible for $8.8 million in incentives in the previous year.

Utility customers pay for these financial incentives, through changes to natural gas rates. When the gas utilities apply to the Ontario Energy Board to receive their incentives, their results are subject to challenge. In 2013, the 2011 incentives for both Enbridge and Union were challenged before the Board - a rare occurrence. The Board responded by lowering the incentives awarded to both Enbridge and Union for 2011 programs (see Section 3.2.2.1).

3.2.2.1 IMPROVING THE ACCURACY OF CUSTOM CONSERVATION PROJECT RESULTS

In 2013, the School Energy Coalition questioned the amount of conservation savings attributed to the 2011 conservation programs of both Union Gas and Enbridge Gas Distribution, and asked the Ontario Energy Board to therefore reduce the utilities' financial incentives.[177]

The concern in both cases was over the savings claimed from custom projects that were undertaken by large industrial customers through utility conservation programs. The School Energy Coalition did not question whether or not the conservation activities occurred. Instead, it made two claims; first, that some of these projects would have proceeded with or without utility assistance, and that this was known to the utilities; second, that the utilities overestimated the amount of energy savings that these projects would deliver (in comparison to what would have happened without utility assistance).

The Board has procedures in place to address both of these issues, which utilities must follow when calculating energy savings. For example, a "free-ridership rate" adjustment for custom projects is used that effectively reduces the amount of claimed energy savings by 54 per cent (on the basis that this percentage of customers would have undertaken conservation action without utility assistance). Similarly, "effective measure lives" of energy-efficient equipment are in place to estimate how long these measures will be in place, so as not to overstate savings. However, the School Energy Coalition argued that these values should not be used if there is more accurate, project-specific information available, and raised evidence for several specific projects to suggest that the utilities' assumptions were faulty, overestimating the amount of utility-influenced savings.

The Board generally agreed with the arguments put forward by the School Energy Coalition, noting its view that "Union did not exercise the requisite due diligence in considering base case, effective useful life and/or persistence",[178] and that Enbridge's "supporting rationale for... the appropriateness of the assumed baselines and measure lives was somewhat lacking".[179] The Board reduced the energy savings attributed to large custom industrial conservation projects for both Union Gas and Enbridge Gas Distribution, thereby lowering the financial incentives earned by Union Gas by $1.6 million and by $0.7 million for Enbridge Gas Distribution.

Because utilities are eligible for financial incentives in relation to the performance of their conservation programs, it is commonly accepted that there is a need for independent oversight. Refinement of this process has continued in recent years. The current framework includes several safeguards: an independent audit of the utility's results, a role for natural gas ratepayer groups to participate through both an Audit Committee and a Technical Evaluation Committee, and ultimately, the ability for any stakeholder to seek recourse to the Board, as was the case here. The implications of the Board's decision will likely be seen in operational refinements to the audit process. The audit of Enbridge's 2013 results shows more rigorous review (by both the auditor and the Audit Committee) of the assumptions regarding custom projects.[180]

3.2.3 INNOVATION IN CONSERVATION PROGRAM DEVELOPMENT

The mix of programs offered by Enbridge and Union continues to be refined each year. A few trends of interest with the 2013 programs are described below.

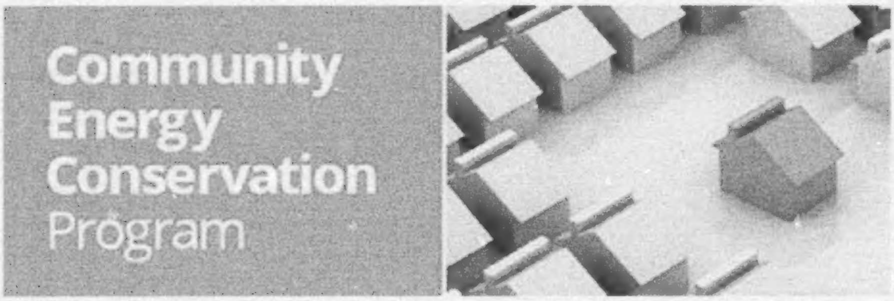
Run it Right – A Step Towards Performance-Based Conservation

The goal of Enbridge's Run it Right program is to achieve energy savings by getting commercial building managers to implement no-cost/low-cost changes to building operational practices. Utilities have encountered difficulty proving the value of programs which rely on changing customer behaviour, because the energy savings are often uncertain. To address this concern, Enbridge determines energy savings from Run it Right by comparing the participating customer's metered energy consumption for a year before and after the operational improvements are undertaken. This approach is more accurate than the traditional means of measuring energy savings for most conservation programs, which involves using engineering assumptions to estimate savings.

Run it Right was offered for the first time in 2012. Because of the requirement for one year of post-project meter measurement, savings from 2012 projects are only now being claimed. Enbridge has encountered some challenges to this data-based approach of measuring energy savings. For example, the average savings from operational improvements in Run it Right turned out to be lower than predicted, and Enbridge and its auditor disagreed about how to adjust reported energy savings to account for other factors that could cause changes in a building's energy consumption. However, these are valuable learnings. The measurement approach used by Run it Right could lead to a performance-based conservation model that more accurately rewards utilities and conservation participants based on actual energy savings.

The Rebirth of Home Energy Retrofit Programs

Since the end of the federal government's ecoENERGY retrofit program (and complementary incentives provided by the Ontario government) in 2012, incentives for substantive energy retrofits (improving insulation, air sealing, space and water heating, etc.) have not been available to the millions of Ontarians who live in inefficient single family homes. Retrofit programs offered by gas utilities are now growing and beginning to fill this niche, although the number of homes being reached is still far less than under the ecoENERGY program.



Enbridge offers the Community Energy Conservation program, which provides homeowners with financial incentives for performing at least two major energy efficiency improvements, and reducing their natural gas consumption by 25 per cent. The program is only offered in certain parts of the province, but has experienced rapid growth: 1,649 households participated in 2013, up from only 209 in 2012. In addition to the incentives offered by Enbridge, participating customers in parts of Toronto are also eligible for low-interest financing through Toronto's Home Energy Loan Program, paid off as a local improvement charge through their property tax bill.[181] If more municipalities proceed with local improvement charge-based programs or the gas utilities offer on-bill financing (as proposed in the Ministry of Energy's *Conservation First* white paper), participation in home retrofit offerings could increase further. Enbridge offers a similar retrofit program to low-income customers in single family buildings (both privately owned and social housing) at no cost to participants. This program reached 1,839 households in 2013, up from 1,107 in 2012.

Union offers similar home retrofit programs for residential customers (Home Reno Rebate) and low-income customers (Helping Homes Conserve). Both programs grew in 2013 (207 households participating in Home Reno Rebate in 2013, up from 96 in 2012; 1,974 households participating in Helping Homes Conserve in 2013, up from 1,755 in 2012).

Direct Access Conservation Funding Accounts for Large-Volume Industrial Customers

In response to customer feedback, Union implemented a new mechanism in 2013 whereby each large customer (customers in the T2 and 100 rate classes, who are primarily industrial customers) has its own account from which it can access funds to invest in energy efficiency projects. If a customer does not spend the full amount by a certain date, the remaining funds becomes available to other customers. This mechanism encourages all large customers to prioritize efficiency investments. In the first year of this approach, 82 per cent of eligible customers submitted energy efficiency plans and accessed funding for at least one project, and 59 per cent of eligible customers spent their entire budget.

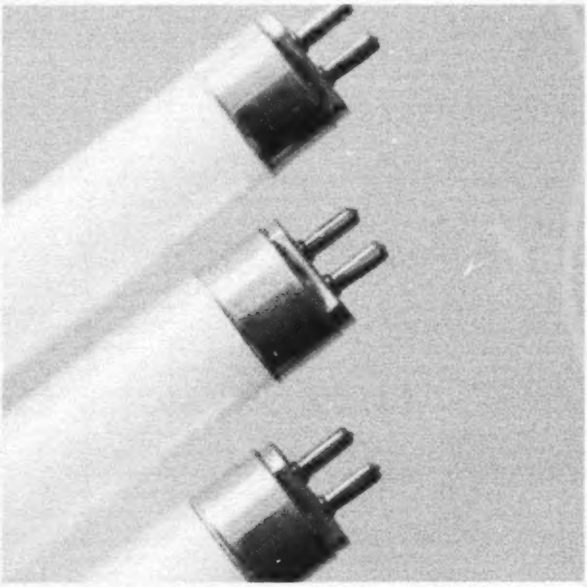
3.2.4 PROGRAM COST AND COST-EFFECTIVENESS

Enbridge and Union spent approximately $60 million on gas conservation programs in 2013 ($27.8 million by Enbridge, and $32.8 million by Union Gas). The amount that utilities are permitted to spend on conservation each year is capped by the Ontario Energy Board. The utilities typically spend their entire conservation budgets each year, but in 2013, Enbridge underspent its budget by almost $4 million – a surprising result. It is uncertain whether more marketing, a different program mix, or higher incentive levels could have enabled more customers to participate in Enbridge's conservation programs.

The conservation initiatives funded by Enbridge and Union continued to offer good value for society. Each dollar spent on energy efficiency (by customers and utilities combined) yielded approximately $2.43 in savings (largely through savings on gas costs) for Enbridge's resource acquisition programs, and $1.53 for Enbridge's low-income programs, as measured using the Total Resource Cost test. Union's programs were even more cost-effective with an average gas savings of $3.83 per dollar spent on efficiency programs.[182]

3.3 THE 2014 LDC ELECTRICITY CONSERVATION TARGETS, YEAR THREE

3.3.1 INTRODUCTION



The 2011-2014 electricity conservation framework assigned a cumulative energy savings target and a peak demand reduction target to each LDC, and required the OPA and LDCs to work together in the design and delivery of conservation programs to meet these targets. In aggregate, the targets are 6,000 GWh of energy savings between 2011 and 2014, and 1,330 MW of peak demand reduction in 2014.

Results for the third year of program operation, 2013, are now available and are generally positive. The ECO has twice previously reported on the programs offered under this framework, and the associated policy and operational issues.[183] As this framework is almost at an end and will soon be replaced by the 2015-2020 Conservation First Framework (see Section 2.4), only a brief summary of 2013 program results is presented here. The ECO will provide a final review of the 2011-2014 framework, including final results, in our 2015 report.

3.3.2 2013 PROVINCE-WIDE PROGRAM RESULTS

saveONenergy℠

The 2013 results from the suite of province-wide electricity conservation programs are presented in Table 11. These initiatives are marketed using the saveONenergy brand name. Results are presented for both 2012 and 2013 to allow for comparison between the two years. A quick appraisal of overall 2012 and 2013 results shows large increases in energy savings and peak demand reduction in 2013 compared to the previous year. However, this trend is partially illusory. Much of the 2013 increase in peak demand reduction is due to the renewal of Demand Response 3 contracts that were originally negotiated prior to the 2011-2014 framework (these savings were not previously counted toward the 2014 targets, but are not really new), and a sizable portion of the energy savings attributed to 2013 are actually "adjustments" from 2012 projects which were reported late. Once these factors are taken into account, the picture is more nuanced, but still positive: a slight increase in program activity levels and overall energy savings, with some programs improving and others on the decline.

Table 11: Incremental Savings from 2013 Province-Wide Conservation Programs by Initiative

Initiative	Incremental Energy Savings (Net) (GWh)		Incremental Demand Reduction (Net) (MW)		Participation	
	2012	2013	2012	2013	2012	2013
Consumer Program						
Appliance Retirement (Fridge & Freezer Pickup)	13.4	8.7	2.0	1.4	34,146 appliances	20,952 appliances
Appliance Exchange	1.0	2.0	0.6	1.1	3,836 appliances	5,337 appliances
HVAC Incentives (Heating & Cooling Incentive)	32.8	33.9	19.1	19.5	87,427 installations	91,581 installations
Conservation Instant Coupon Booklet	1.4	7.7	0.2	0.5	30,891 products	346,896 products
Bi-Annual Retailer Event	26.8	17.2	1.5	1.2	1,060,901 products	944,772 products
Residential New Construction	0.0	0.2	0.0	0.0	19 homes	86 homes
Residential Demand Response *(peaksaver)**	0.4	0.4	49.0	93.1	98,388 devices	171,733 devices
Residential Demand Response (in-home display component)	0.0	0.0	0.0	0.0	49,689 devices	133,657 devices
Consumer Program – All Initiatives	**75.8**	**70.0**	**72.4**	**116.9**		
Business Program						
Retrofit	314.9	345.3	61.1	59.7	6,134 projects	8,785 projects
Direct Install Lighting	57.3	64.3	15.3	18.3	18,691 projects	17,782 projects
Energy Audit	7.0	15.4	1.5	2.8	345 audits	319 audits
New Construction	1.8	5.0	0.8	1.6	69 buildings	86 buildings
Small Commercial Demand Response *(peaksaver)**	1.0	0.4	0.2	0.8	294 devices	1,211 devices
Small Commercial Demand Response (in-home display component)	0.0	0.0	0.0	0.0	0 devices	378 devices
Demand Response 3*	0.3	0.3	19.4	23.7	151 facilities	175 facilities
Business Program – All Initiatives	**381.4**	**430.4**	**98.2**	**107.3**		

Initiative	Incremental Energy Savings (Net) (GWh)		Incremental Demand Reduction (Net) (MW)		Participation	
	2012	2013	2012	2013	2012	2013
Industrial Program						
Process & System Upgrades	0.0	2.6	0.0	0.3	0 projects	3 projects
Demand Response 3*	1.8	4.3	74.1	162.5	185 facilities	281 facilities
Energy Manager	7.4	22.0	1.1	3.6	42 projects	205 projects
Industrial Program – All Initiatives	**9.2**	**28.9**	**75.1**	**166.4**		
Home Assistance Program						
Low Income Initiative (Home Assistance)	5.4	21.0	0.6	2.4	5,033 homes	26,756 homes
Aboriginal Program						
Home Assistance	0.0	1.6	0.0	0.3	0 homes	584 homes
Other						
Program-Enabled Savings	1.2	4.1	2.3	3.7	56 projects	13 projects
Pre-2011 Programs						
Pre-2011 Programs**	11.9	3.5	3.3	0.8	69 projects	4 projects
Adjustments to Reported Results						
Adjustments to Previous Results***	18.7	43.7	1.4	6.9		
All Province-Wide Programs	**503.6**	**603.3**	**253.3**	**404.5**		

Notes:

* Results for the two demand response initiatives (*peaksaver* and Demand Response 3) are reallocated each year. The 2013 incremental results for these two initiatives in essence include the impact of 2011, 2012, and 2013 activity, unlike the other initiatives listed in this table.

** "Pre-2011 programs" include Electricity Retrofit Incentive Program, High Performance New Construction, Multifamily Energy Efficiency Rebate, and Toronto Comprehensive.

*** "Adjustments" refers to minor corrections to reported program results for previous years. Previously reported results can change slightly primarily due to late data. The 2012 "participation" statistics shown for each initiative include the impact of adjustments; however, the energy savings and demand reduction from these adjustments is not assigned to individual initiatives, but to the cell "Adjustments to Previous Results".

Source: Ontario Power Authority

Many new residential customers signed up for the *peaksaver* PLUS initiative, which reduces strain on the electricity system on very hot days by briefly cycling down residential appliances that have a high electricity demand, such as air conditioners and electric water heaters. Participants in this program receive an in-home energy display to track and control their electricity use. An analysis conducted by the OPA found that the in-home energy displays have not had a measurable impact in reducing electricity use, although they did make a contribution by convincing many customers to enroll in *peaksaver* PLUS. Incentives for high-efficiency light-emitting diode (LED) lighting were added in 2013, and proved to be popular both among residential customers (purchased through coupons and retailer events) and small business customers (through the Direct Install Lighting initiative).

The Home Assistance Program, which upgrades the electrical efficiency of low-income households at no cost to participants, saw a fivefold increase in participation, reaching almost 27,000 homes in 2013. The OPA also began offering a similar program (the Aboriginal Conservation Program) to selected First Nation communities in 2013.

As in previous years, the Business Program for commercial and institutional customers accounted for most of the overall energy savings from electricity conservation programs. Participation in the Retrofit initiative, which provides incentives for energy efficiency improvements (particularly lighting upgrades) in existing commercial and institutional buildings, increased by more than 40 per cent. The addition of LED technologies and higher incentive levels helped the Direct Install Lighting initiative continue to reach new customers, despite previous concerns from LDCs that the market for this initiative was close to being saturated. The New Construction initiative, targeting higher-efficiency new commercial buildings, saw little uptake among builders, which was also the case for its program counterpart in the residential sector.

In the industrial sector, 2013 saw encouraging growth in savings achieved by energy managers. Energy managers can either be dedicated to a single facility or employed by an LDC and deployed across the LDC's service territory. Energy managers help companies deliver savings through identifying energy efficiency capital improvements for which incentive funding is available, and by educating businesses to implement low-cost operational improvements that don't require incentives. In contrast to the success of the Energy Manager initiative, only three projects were completed in 2013 under the Process and Systems Upgrade initiative, which offers incentives for energy efficiency investments to distribution-connected industrial customers. While this is an improvement over 2012, when not a single project was completed, it is still disappointing.

Program Spending and Cost-Effectiveness

Spending on province-wide electricity conservation programs is shown in Table 12, and totalled $290.9 million in 2013, a large increase from 2012 ($177.1 million). The majority of the spending increase ($100 million of the $114 million increase) flowed directly to participants in conservation programs – particularly businesses – in the form of incentives and related support, with the remainder going to increased administration costs. Spending on conservation programs is recovered from all electricity ratepayers through a relatively small portion (about 3 per cent) of the Global Adjustment charge.[184]

Table 12: 2013 Province-Wide Conservation Program Spending

Program	Central Program Services (OPA) ($)	Customer Incentives, Participant Based Funding, and Capability Building ($)	LDC Administration Costs (Program Administration Budget) ($)	Total Actual Charges ($)
Consumer Program	7,088,654	72,249,999	24,076,180	103,414,833
Business Program	2,169,213	98,104,239	28,733,641	129,007,093
Industrial Program	14,474,019	21,626,996	5,447,101	41,548,117
Home Assistance Program	174,011	12,176,153	4,000,076	16,350,239
Aboriginal Program	529,268	87,651	0	616,919
Total – All Province-Wide Programs	**24,435,165**	**204,245,038**	**62,256,997**	**290,937,200**

Note: Central Program Services include: program delivery services, evaluation, measurement & verification, marketing, awareness campaigns, IT support, call centre, technical review services, settlement services.

Source: Ontario Power Authority

The cost effectiveness of province-wide conservation programs from 2011 to 2013 is shown in Table 13. Two cost-effectiveness tests are used. Both tests compare the lifetime program benefits (primarily from cost savings due to reduced electricity consumption) and costs, but from different perspectives. The Total Resource Cost test considers the impact on all parties, including ratepayers and program participants. The Program Administrator Cost test considers the costs and benefits from the perspective of the program administrator (the OPA). For both tests, a ratio of greater than one indicates that the conservation program benefits exceed the costs. The portfolio of province-wide conservation programs has been cost-effective using either test, which is a requirement of the conservation framework. However, the cost-effectiveness of programs for different sectors varies widely. The OPA expects that the cost-effectiveness of industrial programs will improve as more conservation projects are completed in future years. These cost-benefit analyses were done prior to the Minister's October 2014 direction that the Total Resource Cost test should be modified to include a value for the non-energy benefits of conservation (e.g., environmental benefits). If the new methodology was used, the Total Resource Cost test ratios shown in Table 13 would be slightly higher.

The levelized delivery cost of conservation is also shown in Table 13. For energy efficiency programs, this is the cost (from the program administrator's perspective) of saving a unit of electricity through conservation programs, which allows comparison with the cost of generating the same unit of power. For demand response programs, the levelized cost is the cost of reducing a unit of peak demand, which can be compared with the cost of building a new generating plant to meet peak demand. The levelized cost of energy efficiency programs from 2011 to 2013 was 3.7 cents per kilowatt-hour, which is much lower than any new form of electricity generation.

Table 13: Cost-Effectiveness of 2011-2013 Province-Wide Conservation Programs

Program	Total Resource Cost Test Benefit: Cost Ratio	Program Administrator Cost Test Benefit: Cost Ratio	Levelized Delivery Cost	
			Energy Efficiency (¢/kWh)	Demand Response ($/MW-month)
Consumer	1.1	1.5	5.5	14,745 (*peaksaver* PLUS)
Business	1.3	2.8	3.0	Not Applicable
Industrial	0.8	1.0	11.0	9,776 (Demand Response 3)
Low Income	0.6	0.6	11.5	Not Applicable
Total - All Province-Wide Programs	**1.2**	**2.1**	**3.7**	**13,469**

Notes:

Consumer program results also include commercial participants in Residential Demand Response initiative; Business program results also include industrial participants in Retrofit initiative; Industrial program results also include commercial participants in Demand Response 3 initiative. Levelized delivery cost is calculated from the program administrator's perspective, and excludes incremental customer costs of conservation measures.

Source: Ontario Power Authority

3.3.3 PROGRESS ON 2014 TARGETS

Conservation results from 2011, 2012, and 2013 programs (as well as 2014 programs, for which results are not yet available) are counted towards the 2014 targets. The aggregate province-wide targets for all LDCs are cumulative energy savings of 6,000 GWh (about 1 per cent of expected total electricity consumption over the four years) and a reduction in provincial peak demand of 1,330 MW (approximately 5 percent of Ontario's system peak). Progress towards these targets is shown in Figure 19 and Figure 20.

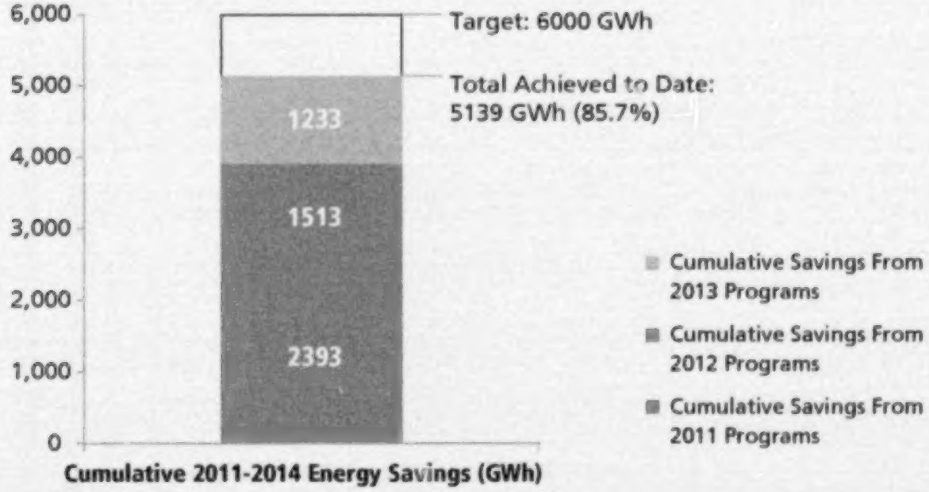


Figure 19: Province-Wide Progress To 2014 Energy Target

Note: Results for 2012 and 2013 include minor adjustments to previous years' verified results

Source: Ontario Power Authority

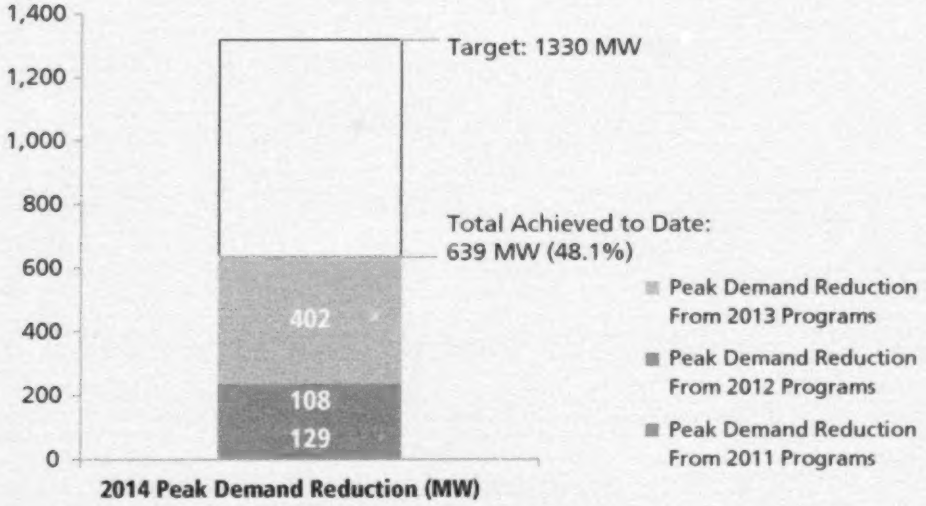


Figure 20: Province-Wide Progress To 2014 Peak Demand Target

Note: The 2014 peak demand reduction of 402 MW assumes that all existing demand response customers (Demand Response 3 and Residential Demand Response) remain in place in 2014.

Source: Ontario Power Authority

As Figure 19 shows, Ontario LDCs have on aggregate achieved approximately 86 per cent of the 2014 energy target. Because of the cumulative nature of this target, whereby savings achieved in early years of the framework are given greater weight, this puts LDCs on pace to come close to the target, but fall slightly short, despite the strong 2013 program results.[185] With less than half of the peak demand target achieved through 2013, there is likely no chance that this target will be reached.

The results shown do not include energy savings or peak demand reduction due to time-of-use (TOU) pricing. The OPA has been evaluating the impact of TOU pricing, and so far has found little or no evidence of energy savings, but a small impact on peak demand reduction, as discussed in Section 2.7. The OPA intends to refine its evaluation and provide a final estimate of TOU impact that will be counted towards final 2014 results. The peak demand impact of TOU pricing could be as large as several hundred MW, but is unlikely to provide a large enough boost for LDCs to meet the aggregate 2014 peak demand target.

3.3.4 INDIVIDUAL LDC RESULTS

The progress of individual LDCs towards the 2014 targets is shown in Figure 21, as of December 31, 2013. Larger LDCs are clustered around the mean level of achievement, with smaller LDCs represented on both ends of the performance spectrum. Full numerical results for each LDC are presented in Appendix B.

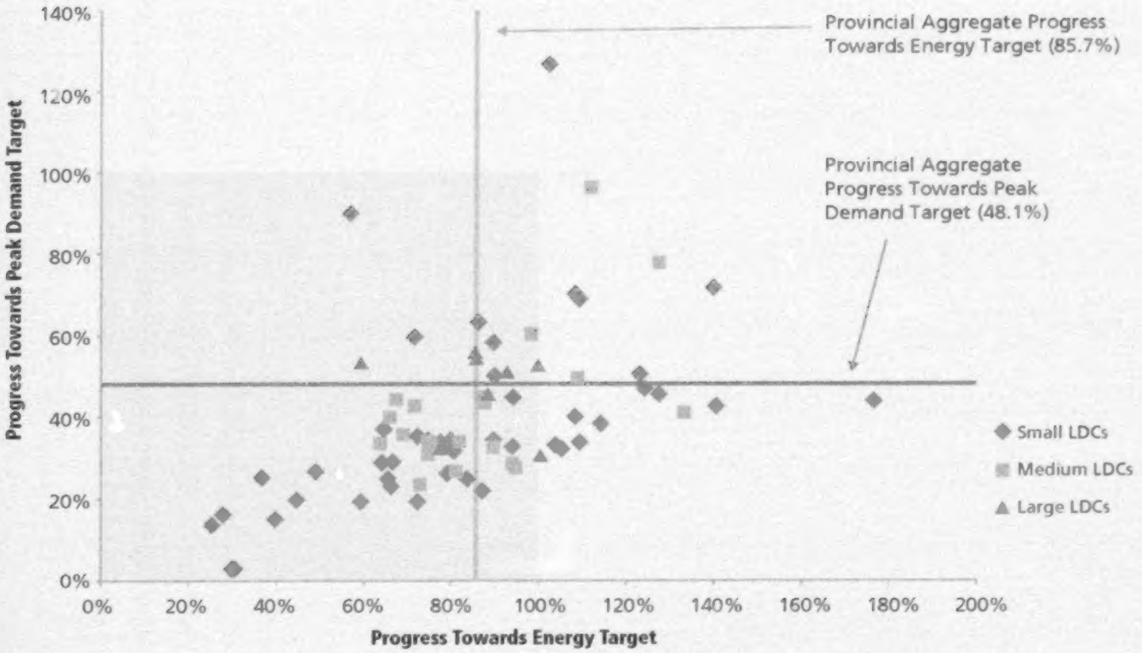


Figure 21: LDC Progress To 2014 Conservation Targets, as of December 31, 2013

Note: Progress towards peak demand target assumes that savings from demand response programs persist until 2014. "Small LDCs" have an energy target accounting for less than 0.5 per cent of the aggregate 2014 LDC energy target; "medium LDCs" have an energy target accounting for between 0.5 per cent and 2 per cent of the aggregate target, and "large LDCs" have an energy target accounting for more than 2 per cent of the aggregate target.

Source: Ontario Power Authority

Nineteen LDCs have already met their energy target, and perhaps an equal number of additional LDCs have at least an outside chance of reaching their target by the end of 2014. On the other hand, only one LDC (Welland Hydro) has met its peak demand target.

Progress on the peak demand target has been impacted by changes to the Demand Response 3 initiative. The OPA lowered incentive levels for this initiative in parts of the province where the value of demand response to the electricity system was lower. According to some LDCs in these areas, the lower incentive levels made it more difficult to attract customers. In addition, the Ministry of Energy's direction to transition demand response from the OPA to the Independent Electricity System Operator will prevent the OPA from offering new longer-term demand response contracts.[186] There was a solid rationale for both of these decisions, but their effect on the ability of LDCs to meet their peak demand targets should be noted.

It is clear that many LDCs will miss one or both of their 2014 targets, which would put them in breach of their distribution licence conditions with the Board.

3.3.5 NEW CONSERVATION PROGRAMS

When the 2011-2014 conservation framework was developed, it was assumed that new custom programs designed by LDCs (and approved by the OEB) would make significant contributions towards the energy and peak demand targets. This has not been the case, and no custom programs were approved in 2011 or 2012, due in part to LDC concerns about the difficulty of moving program applications through the OEB review process. However, in 2013, PowerStream received approval from the OEB to fund the Business Refrigeration Incentives program, which provides an audit and incentive funding to small business customers to upgrade inefficient refrigeration equipment. This program was launched in September 2013. PowerStream saw immediate interest, with 286 businesses enrolling by the end of 2013. Only six businesses had installed energy upgrades by the end of the year, so the savings from this program in 2013 are not material. However, the program will deliver savings in 2014.[187]

No other custom program applications have been submitted to the OEB for consideration, although many LDCs have been actively pursuing pilot conservation programs through the OPA's Conservation Fund which provides small amounts of financial support to innovative electricity conservation initiatives. The OPA notes that seventeen different proposals from LDCs are at various stages of development. Pilot projects that have reached market include: Toronto Hydro's GridSaver program which uses programmable thermostats to control rooftop air-conditioning units in commercial buildings to reduce peak demand; Cambridge and North Dumfries Hydro's Rush Hour Rewards program which uses a Nest learning thermostat to monitor and adjust patterns of energy use for heating and cooling among residential customers; and, Niagara Peninsula Energy's load shifting pilot for electric vehicles.

3.3.6 RESULTS OF OPA-ONLY PROGRAMS

The OPA also operates several conservation programs without the involvement of LDCs. These programs are designed for large customers (primarily industrial facilities) connected directly to the transmission system, instead of an LDC's distribution network.

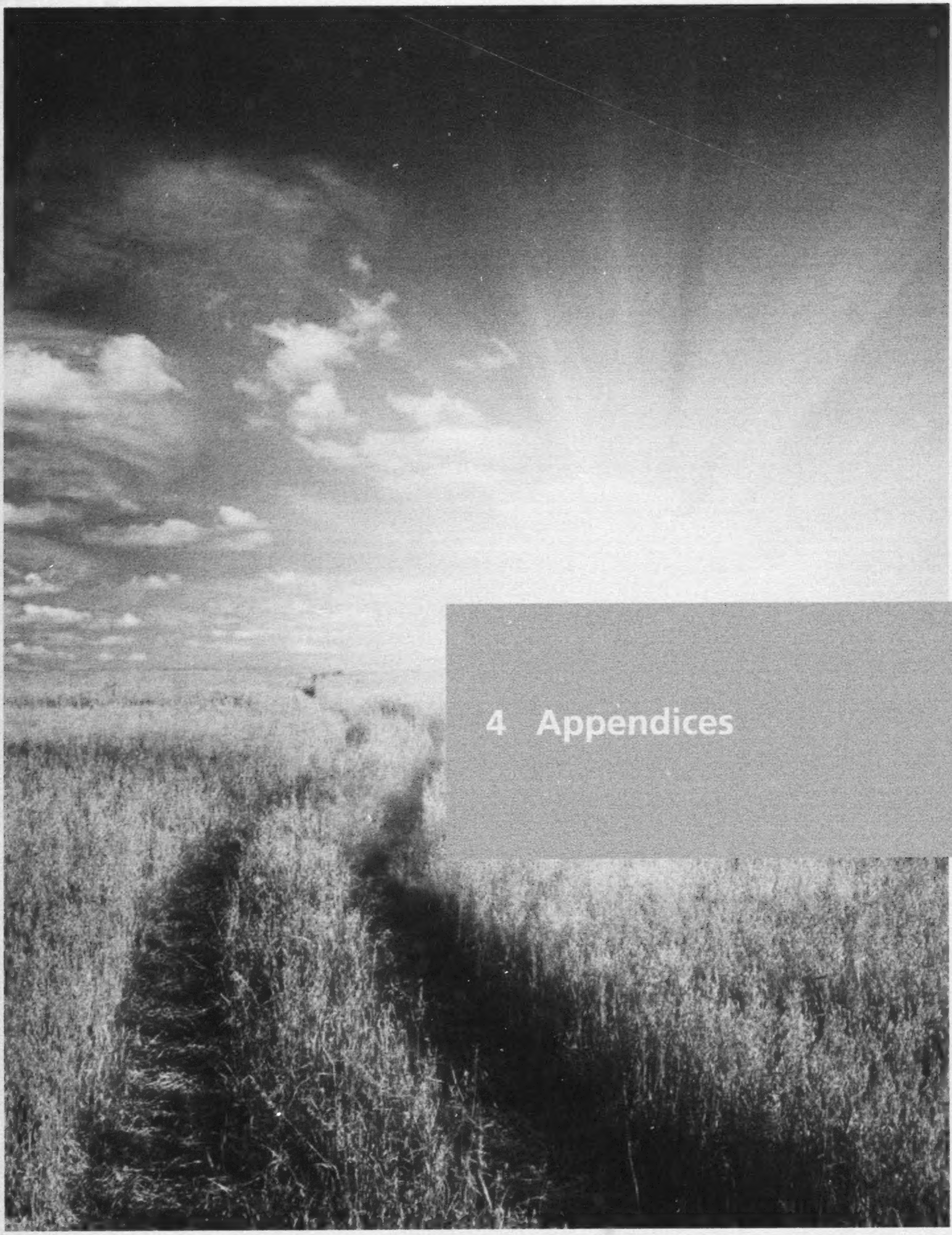
The primary OPA-only program is the Industrial Accelerator which supports large energy efficiency investments in industrial processes.[188] In each year since its launch in 2010, the Industrial Accelerator program has failed to deliver results, even though it offers very high incentives covering up to 70 per cent of total project cost. Despite this lacklustre performance, in July 2014 the Minister of Energy issued a further direction to the OPA extending Industrial Accelerator through 2020, matching the time period of the new Conservation First LDC program framework.[189] This direction also set a target for energy savings from Industrial Accelerator: 1.7 TWh in savings by 2020, which is about one-quarter of the savings expected from all 2015-2020 LDC programs, and more than an order of magnitude higher than savings achieved from this program to date.

Results for all OPA-only programs in 2012 are shown in Table 14. These results do not count towards the 2011-2014 LDC targets, but do count towards the 2032 Long-Term Energy plan target noted in section 2.3. Total spending on OPA-only programs in 2012 was $56.3 million, which includes spending on the programs listed below and $3.3 million for the Conservation Fund. Peak demand reduction from Demand Response 3 is down more than 100 MW from its 2012 value of 248.8 MW. This is because many Demand Response 3 contracts that were previously counted in the OPA-only results were renewed in 2013, and savings from these contracts are now counted in the results for LDC province-wide programs.

Table 14: Incremental Savings From 2013 OPA-Only Programs

Program	Incremental Energy Savings (Net) (GWh)	Incremental Peak Demand Reduction (Net) (MW)
Industrial Accelerator	8.0	0.7
Demand Response 2	73.9	53.6
Demand Response 3	2.3	130.9
Residential Demand Response *(peaksaver)*[190]	0.2	39.8
All OPA-Only Programs	**84.4**	**225.0**

Source: Ontario Power Authority



4 Appendices

APPENDIX A: ONTARIO ENERGY CONSUMPTION

The ECO is responsible for reporting on the progress of government activities related to reducing, or making more efficient use of, electricity, natural gas, propane, oil, and transportation fuels. Throughout 2013 and 2014, the government continued to place emphasis primarily on policies and initiatives to reduce Ontario's consumption of electricity (see Figure 1). However, as the following analysis highlights, electricity accounts for just over one-fifth of Ontario's total energy demand by fuel type.

Appendix A provides an update on Ontario's fuel consumption with available data derived from energy consumption data contained in the Report on Energy Supply and Demand in Canada and supplementary tables published by Statistics Canada.[191]

Methodological changes made to the data surveys that supply information to the Report on Energy Supply and Demand in Canada[192] were outlined in a previous ECO report[193] and are incorporated into the following analysis. Since the publication of the ECO's 2012 Annual Energy Conservation Progress Report, revised data were published by Statistics Canada for the 2011 calendar year.[194] This report presents updated data for 2011 and preliminary data available for 2012, and analyzes trends in Ontario's energy consumption statistics for both calendar years.

Analysis

Ontario's 2012 energy demand (based on preliminary data) was 2,405 petajoules (PJ), 4 per cent lower than demand in 2011. Figure 22 shows the breakdown of energy demand by fuel type for Ontario in 2011 and 2012. In 2012, natural gas and transportation fuels together accounted for 69 per cent of the total energy demand (about 1 per cent less than in 2011). Meanwhile, electricity accounted for approximately 20 per cent of Ontario's overall energy demand in each year. Propane, oil and other fuels[195] accounted for roughly 10 per cent of Ontario's overall demand in both 2011 and 2012. These proportional trends are virtually identical to those observed between 2007 and 2010 (see Table 15).

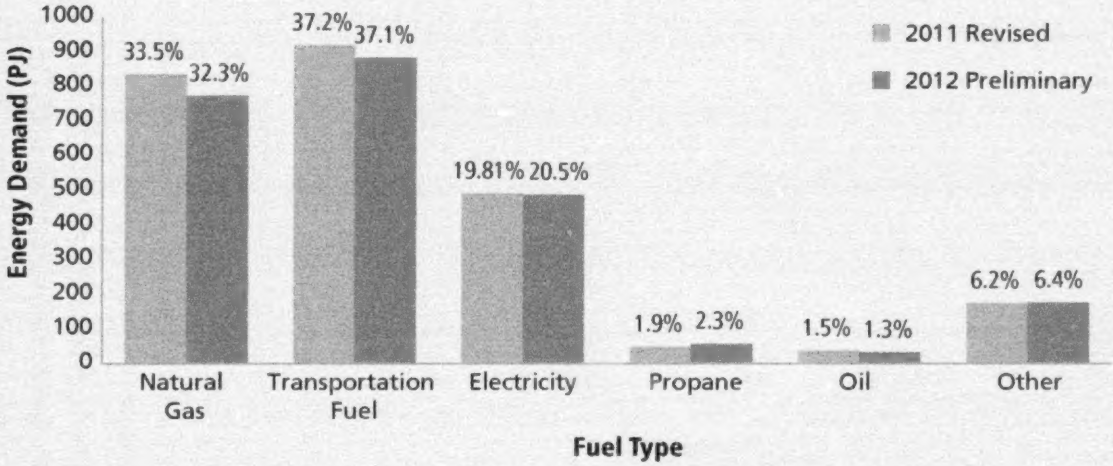


Figure 22: Ontario 2011 (revised) and 2012 (preliminary) Total Energy Demand by Fuel Type

Note: Oil demand includes kerosene and stove oil, and light fuel oil amounts; Transportation Fuel includes motor gasoline, diesel fuel oil, heavy fuel oil, aviation gasoline, and aviation turbo fuel amounts. Details of Oil and Transportation Fuels come from CANSIM table128-0016.

Source: Statistics Canada

Table 15: Annual Ontario Total Energy Demand by Fuel Type

Year	Natural Gas (PJ)	Transportation Fuel (PJ)	Electricity (PJ)	Propane (PJ)	Oil (PJ)	Other (PJ)	Total (PJ)
2007	892	909	548	40	41	192	2621
2008	884	908	586	43	34	187	2643
2009	801	897	464	38	34	152	2387
2010	776	918	480	41	34	173	2422
2011[r]	837	930	495	49	36	155	2503
2012	776	893	494	56	32	156	2405

r= revised by Statistics Canada since publication in previous ECO report.

Note: all values in Table 15 incorporate methodological changes made by Statistics Canada. In the Report on Energy Supply and Demand, total energy demand for propane includes demand for the fuel for non-energy end uses (76 PJ). For all other fuels, demand for non-energy uses is not included in total energy demand amounts. The table above excludes fuel for non-energy end uses. Propane demand for non-energy uses increased in Ontario by 24 per cent between 2010 and 2012, see CANSIM table 128-0012.

Source: Statistics Canada

Ontario's 2012 total energy demand declined by 4 per cent compared to 2011 levels. Although larger in magnitude, the decline was consistent with the 0.6 per cent Canada-wide decline in energy consumption in 2012. Energy demand in Ontario decreased across all major sectors of the economy.

Transportation fuel remained the main source of energy consumed in Ontario in 2012, followed by natural gas. Although transportation fuel demand accounted for the same proportion of Ontario's total energy demand in 2012 as in 2011 (~37 per cent), total consumption of transportation fuel in Ontario declined in 2012. Almost all of Ontario's 2012 energy demand reduction was due to lower demand for transportation fuel and natural gas (-37 PJ and -61 PJ, respectively), with smaller reductions in electricity and oil demand. In its 18-Month Outlook for December 2011 to May 2013, Ontario's Independent Electricity System Operator (IESO) noted that electricity demand would be moderated by conservation efforts in 2011 and 2012 and weaker than anticipated economic growth. A decline in motor gasoline demand was the primary driver of the transportation fuel decline, likely due to ongoing improvements in vehicle fuel efficiency and record-high fuel prices in 2012.[196] This is consistent with National Energy Board projections of slowing transportation-related petroleum consumption over the next 20 years in Canada as support for electric vehicles and alternative transportation fuel grows.

Although its contribution to total fuel demand is small, Ontario's propane demand increased by approximately 14 per cent in 2012. Propane is a natural gas liquid primarily consumed for heating purposes in the commercial and residential sectors. Since 2011, higher prices for natural gas liquids relative to the price of natural gas have encouraged the development of more liquids-rich natural gas.[197] Consumption of fuels in the 'other' category remained almost constant in 2011 and 2012.

APPENDIX B: 2013 CONSERVATION RESULTS FOR EACH LDC

	Target		Achieved To Date		
	2011-2014 Cumulative Energy Savings	LDC's Share of Aggregate Provincial Energy Target	2013 Annual Energy Savings	2011-2014 Cumulative Energy Savings	Amount of 2011-2014 Energy Target Achieved
LDC	GWh	%	GWh	GWh	%
Algoma Power Inc.	7.37	0.12	0.64	3.28	44.5%
Atikokan Hydro Inc.	1.16	0.02	0.04	0.69	59.3%
Attawapiskat Power Corporation	0.29	0.005	0.01	0.09	30.2%
Bluewater Power Distribution Corporation	53.73	0.9	2.78	38.55	71.8%
Brant County Power Inc.	9.85	0.16	0.65	7.12	72.3%
Brantford Power Inc.	48.92	0.82	5.08	43.80	89.5%
Burlington Hydro Inc.	82.37	1.37	8.22	71.48	86.8%
Cambridge and North Dumfries Hydro Inc.	73.66	1.23	10.95	98.19	133.3%
Canadian Niagara Power Inc.	25.08	0.41	2.27	16.18	64.5%
Centre Wellington Hydro Ltd.	7.81	0.13	0.69	8.54	109.4%
Chapleau Public Utilities Corporation	1.21	0.02	0.15	1.69	139.8%
COLLUS Power Corporation	14.97	0.25	1.69	9.61	64.2%
Cooperative Hydro Embrun Inc.	1.12	0.02	0.22	1.39	124.1%
E.L.K. Energy Inc.	8.25	0.14	0.65	6.93	84.0%
Enersource Hydro Mississauga Inc.	417.22	6.95	39.44	357.69	85.7%
ENTEGRUS	46.53	0.78	4.74	37.74	81.1%
ENWIN Utilities Ltd.	117.89	1.96	21.42	128.45	109.0%
Erie Thames Powerlines Corporation	22.97	0.31	5.90	25.09	109.2%
Espanola Regional Hydro Distribution Corporation	2.76	0.05	0.16	2.99	108.3%
Essex Powerlines Corporation	21.54	0.36	2.36	19.32	89.7%
Festival Hydro Inc.	29.25	0.49	2.81	37.22	127.3%
Fort Albany Power Corporation	0.24	0.004	0.01	0.07	30.5%
Fort Frances Power Corporation	3.64	0.06	1.05	3.94	108.3%
Greater Sudbury Hydro Inc.**	43.71	0.73	4.74	32.60	74.6%
Grimsby Power Inc.	7.76	0.13	1.22	9.55	123.1%
Guelph Hydro Electric Systems Inc.	79.53	1.33	8.10	101.31	127.4%
Haldimand County Hydro Inc.	13.3	0.22	1.36	11.93	89.7%
Halton Hills Hydro Inc.	22.48	0.37	1.24	16.23	72.2%
Hearst Power Distribution Company Limited	3.91	0.07	0.36	1.92	49.2%
Horizon Utilities Corporation	281.42	4.69	27.15	240.90	85.6%

Target		Achieved To Date		
2014 Peak Demand Reduction Target	LDCs Share of Aggregate Provincial Peak Demand Target	2013 Peak Demand Reduction	2014 Persistent Peak Demand Reduction*	Amount of 2014 Demand Target Achieved*
MW	%	MW	MW	%
1.28	0.1	0.16	0.25	19.6%
0.2	0.02	0.01	0.04	19.5%
0.07	0.01	0.0004	0.002	2.9%
10.65	0.8	2.60	4.58	43.0%
3.3	0.25	0.25	0.64	19.4%
11.38	0.86	1.85	3.71	32.6%
21.95	1.65	6.35	9.92	45.2%
17.68	1.33	3.21	7.27	41.1%
6.4	0.48	1.70	2.39	37.3%
1.64	0.12	0.69	1.13	69.0%
0.17	0.01	0.04	0.12	71.8%
3.14	0.24	0.52	0.90	28.8%
0.34	0.03	0.09	0.16	47.1%
2.69	0.2	0.28	0.67	24.8%
92.98	6.99	33.05	50.87	54.7%
12.12	0.91	1.37	3.22	26.6%
26.81	2.02	8.41	13.25	49.4%
5.22	0.32	1.08	1.77	33.9%
0.52	0.04	0.04	0.21	40.0%
7.19	0.54	3.33	4.18	58.2%
6.23	0.47	0.91	2.85	45.7%
0.05	0.004	0.0004	0.002	3.0%
0.61	0.05	0.30	0.43	70.3%
8.22	0.62	1.10	2.56	31.1%
2.06	0.15	0.59	1.04	50.5%
16.71	1.26	6.09	12.98	77.6%
2.85	0.21	0.40	0.98	34.2%
6.15	0.46	1.41	2.16	35.1%
0.68	0.05	0.09	0.18	26.5%
60.36	4.54	23.18	33.68	55.8%

	Target		Achieved To Date		
	2011-2014 Cumulative Energy Savings	LDC's Share of Aggregate Provincial Energy Target	2013 Annual Energy Savings	2011-2014 Cumulative Energy Savings	Amount of 2011-2014 Energy Target Achieved
LDC	GWh	%	GWh	GWh	%
Hydro 2000 Inc.	1.04	0.02	0.37	1.46	140.5%
Hydro Hawkesbury Inc.	9.28	0.15	0.59	6.13	66.1%
Hydro One Brampton Networks Inc.	189.54	3.16	22.26	146.58	77.3%
Hydro One Networks Inc.	1130.21	18.84	80.08	673.45	59.6%
Hydro Ottawa Limited	374.73	6.25	42.60	332.36	88.7%
Innisfil Hydro Distribution Systems Limited	9.2	0.15	1.30	6.85	74.5%
Kashechewan Power Corporation	0.33	0.01	0.01	0.10	29.8%
Kenora Hydro Electric Corporation Ltd.	5.22	0.09	0.31	1.32	25.4%
Kingston Hydro Corporation	37.16	0.62	6.16	41.58	111.9%
Kitchener-Wilmot Hydro Inc.	90.29	1.5	8.93	88.93	98.5%
Lakefront Utilities Inc.	13.59	0.23	0.78	9.05	66.6%
Lakeland Power Distribution Ltd.	10.18	0.17	0.86	8.05	79.1%
London Hydro Inc.	156.64	2.61	15.84	157.45	100.5%
Midland Power Utility Corporation	10.82	0.18	1.40	9.33	86.2%
Milton Hydro Distribution Inc.	33.5	0.56	2.02	24.41	72.9%
Newmarket - Tay Power Distribution Ltd.	33.05	0.55	3.12	31.03	93.9%
Niagara Peninsula Energy Inc.	58.04	0.97	7.08	54.97	94.7%
Niagara-on-the-Lake Hydro Inc.	8.27	0.14	1.01	8.58	103.7%
Norfolk Power Distribution Inc.	15.68	0.26	1.93	12.62	80.5%
North Bay Hydro Distribution Limited	26.1	0.44	3.03	23.43	89.8%
Northern Ontario Wires Inc.	5.88	0.1	0.67	4.66	79.3%
Oakville Hydro Electricity Distribution Inc.	74.06	1.23	5.23	55.73	75.3%
Orangeville Hydro Limited	11.82	0.2	0.58	8.47	71.7%
Orillia Power Distribution Corporation	15.05	0.25	0.95	14.17	94.1%
Oshawa PUC Networks Inc.	52.24	0.87	5.36	33.32	63.8%
Ottawa River Power Corporation	8.97	0.15	0.73	6.95	77.5%
Parry Sound Power Corporation	4.16	0.07	0.14	1.65	39.8%
Peterborough Distribution Incorporated	38.45	0.64	3.09	28.71	74.7%
PowerStream Inc.***	407.34	6.79	52.14	377.38	92.6%
PUC Distribution Inc.	30.83	0.51	3.93	26.87	87.2%
Renfrew Hydro Inc.	4.86	0.08	0.25	3.87	79.7%
Rideau St. Lawrence Distribution Inc.	5.1	0.09	0.28	5.82	114.1%
Sioux Lookout Hydro Inc.	3.32	0.06	0.21	0.93	27.9%

Target		Achieved To Date		
2014 Peak Demand Reduction Target	LDC's Share of Aggregate Provincial Peak Demand Target	2013 Peak Demand Reduction	2014 Persistent Peak Demand Reduction*	Amount of 2014 Demand Target Achieved*
MW	%	MW	MW	%
0.19	0.01	0.03	0.08	42.6%
1.82	0.14	0.15	0.42	23.0%
45.61	3.43	8.59	14.68	32.2%
213.66	16.06	84.23	114.46	53.6%
85.26	6.41	22.50	38.86	45.6%
2.5	0.19	0.69	0.86	34.3%
0.07	0.01	0.0005	0.002	2.9%
0.86	0.06	0.07	0.12	13.6%
6.63	0.5	4.69	6.38	96.2%
21.56	1.62	8.97	12.98	60.2%
2.77	0.21	0.44	0.81	29.2%
2.32	0.17	0.20	0.61	26.4%
41.44	3.12	5.93	12.64	30.5%
2.39	0.18	1.11	1.51	63.3%
8.05	0.61	0.72	1.90	23.6%
8.76	0.66	0.95	2.49	28.5%
15.49	1.16	2.00	4.33	28.0%
2.42	0.18	0.38	0.80	33.2%
4.25	0.32	0.69	1.34	31.6%
5.05	0.38	1.48	2.53	50.1%
1.06	0.08	0.14	0.35	32.9%
20.7	1.56	3.73	6.79	32.8%
2.78	0.21	1.18	1.66	59.9%
3.07	0.23	0.73	1.38	45.0%
12.52	0.94	2.64	4.18	33.4%
1.61	0.12	0.17	0.55	34.1%
0.74	0.06	0.03	0.11	15.3%
8.72	0.66	1.48	2.94	33.8%
95.57	7.19	31.66	48.72	51.0%
5.58	0.42	1.07	2.43	43.5%
1.05	0.08	0.10	0.36	34.3%
1.22	0.09	0.06	0.47	38.4%
0.51	0.04	0.06	0.08	16.1%

LDC	Target: 2011-2014 Cumulative Energy Savings	Target: LDC's Share of Aggregate Provincial Energy Target	Achieved To Date: 2013 Annual Energy Savings	Achieved To Date: 2011-2014 Cumulative Energy Savings	Achieved To Date: Amount of 2011-2014 Energy Target Achieved
	GWh	%	GWh	GWh	%
St. Thomas Energy Inc.	14.92	0.25	2.70	15.69	105.2%
Thunder Bay Hydro Electricity Distribution Inc.	47.38	0.79	7.52	31.88	67.3%
Tillsonburg Hydro Inc.	10.25	0.17	0.37	5.84	57.0%
Toronto Hydro-Electric System Limited	1303.39	21.73	135.45	1301.49	99.8%
Veridian Connections Inc.	115.74	1.93	8.67	79.84	69.0%
Wasaga Distribution Inc.	4.01	0.07	0.23	3.49	87.1%
Waterloo North Hydro Inc.	66.49	1.11	6.36	54.39	81.8%
Welland Hydro-Electric System Corp.	20.6	0.34	4.48	21.03	102.1%
Wellington North Power Inc.	4.52	0.08	0.35	2.96	65.5%
West Coast Huron Energy Inc.	8.28	0.14	0.27	3.03	36.6%
Westario Power Inc.	20.95	0.35	2.02	19.68	93.9%
Whitby Hydro Electric Corporation	39.07	0.65	3.20	25.71	65.8%
Woodstock Hydro Services Inc.	18.88	0.31	2.28	33.33	176.6%
TOTAL	**6000**	**100**	**603.26**	**5139.11**	**85.7%**

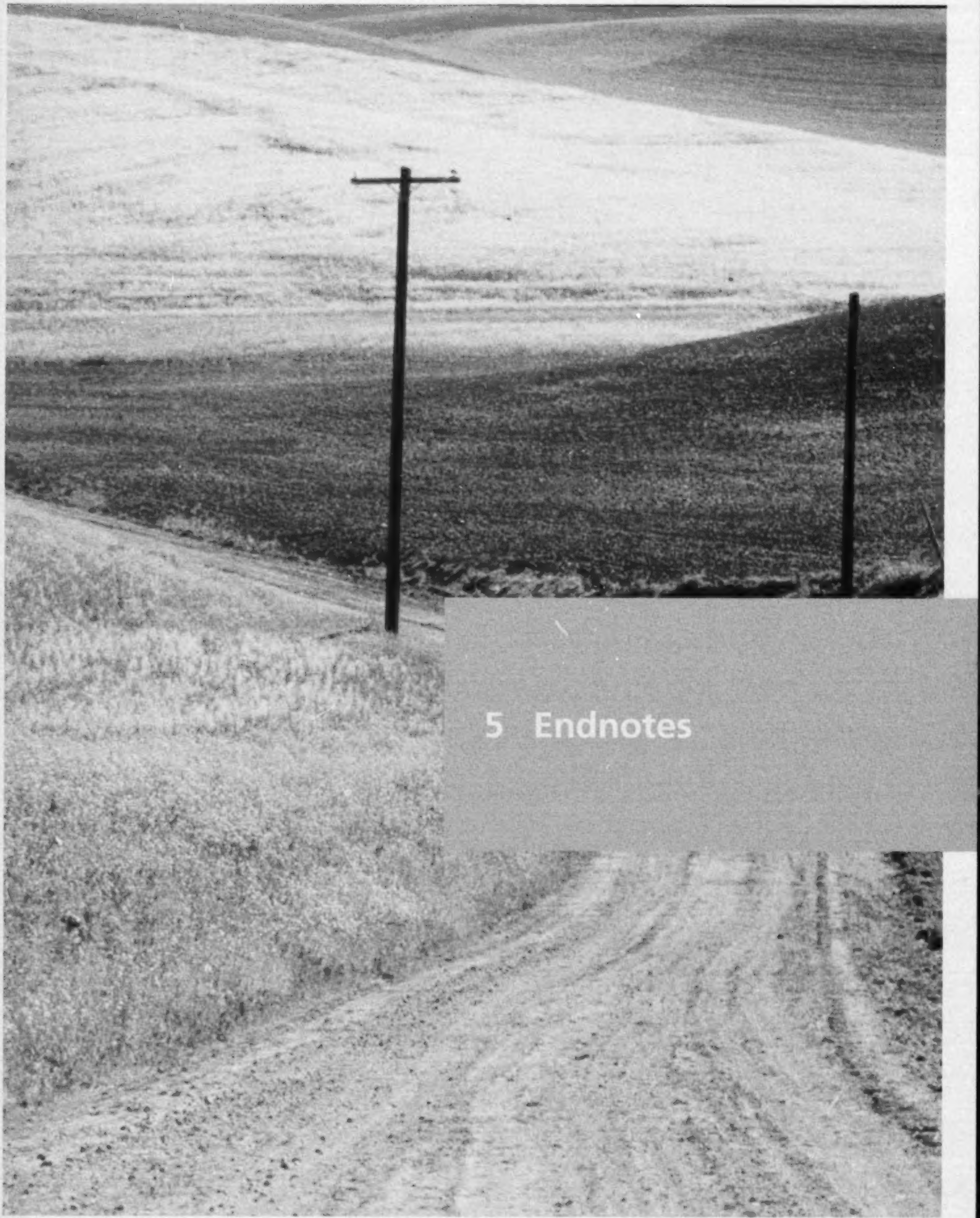
Notes

* Assumes all 2013 demand response savings persist in 2014.

** Uniquely among LDCs, Greater Sudbury Hydro Inc. delivered custom conservation programs that were approved and funded prior to the current conservation framework. The savings from these programs are not included in the results shown in this table, as the Ontario Energy Board has not yet determined whether these savings will count towards the utility's 2014 Target. Results from Greater Sudbury Hydro Inc.'s custom programs would increase the utility's progress towards its peak demand target by 1.3% and its 2014 energy target by 10.9%.

*** PowerStream Inc. delivered a custom Board-approved program, the Business Refrigeration Initiative. While results from this program are not captured in the above table, the program was launched in late 2013 and it therefore would have only had a small impact on the utility's progress towards its peak demand reduction target and its energy savings target.

Target		Achieved To Date		
2014 Peak Demand Reduction Target	LDC's Share of Aggregate Provincial Peak Demand Target	2013 Peak Demand Reduction	2014 Persistent Peak Demand Reduction*	Amount of 2014 Demand Target Achieved*
MW	%	MW	MW	%
3.94	0.3	0.64	1.28	32.4%
8.48	0.64	2.64	3.73	44.0%
2.29	0.17	1.71	2.06	90.0%
286.27	21.52	93.63	150.99	52.7%
29.05	2.18	6.34	10.38	35.7%
1.34	0.1	0.13	0.30	22.0%
15.79	1.19	2.78	5.38	34.1%
5.56	0.42	6.33	7.05	126.7%
0.93	0.07	0.06	0.23	24.9%
0.88	0.07	0.09	0.22	25.3%
4.24	0.32	0.48	1.39	32.8%
10.9	0.82	3.16	4.34	39.8%
4.49	0.34	0.57	1.96	43.7%
1330	**100**	**404.54**	**639.27**	**48.1%**



5 Endnotes

ENDNOTES

1. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2009 (Volume One)*, page 6, May 2010 contains a full description of the reporting mandate and approach.
2. Others included directives for procurement of energy-from waste, non-utility bio-mass generation, a large renewables tender, and standard offer program for non-utility hydro-electric generation.
3. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2012* (*Volume Two*), pages 51-57, December 2013.
4. Ministry of Transportation, information provided to the ECO in response to ECO inquiry, August 19, 2014.
5. Ibid.
6. Ministry of Transportation, news release, *Ontario Moving Forward With High-Speed Rail*, December 5, 2014
7. Government of Ontario, report, *Conservation First: A Renewed Vision for Energy Conservation in Ontario*, page 4, July 2013. http://www.energy.gov.on.ca/en/files/2014/09/conservation-first-en.pdf
8. *Conservation First* proposals: Government of Ontario, report, *Conservation First: A Renewed Vision for Energy Conservation in Ontario*, July 2013. http://www.energy.gov.on.ca/en/files/2014/09/conservation-first-en.pdf. Ministry of Energy comments on progress: Ontario Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014; and Ontario Ministry of Energy, information provided to the ECO in response to ECO fact-check, December 9, 2014. In all cases where the Ministry indicated it is either conducting or planning to conduct an analysis or examination of the policy or proposal, it provided no specific details.
9. For example, the Ministry of Energy failed to use the Environmental Registry to consult on the Feed-in Tariff Review. Environmental Commissioner of Ontario, report, *Losing Touch: Annual Report 2011/2012 Part 1*, section 2.1, September 2013. http://www.ecoissues.ca/index.php/Losing_Touch:Games_Ministries_Play
10. Government of Ontario, report, *Conservation First: A Renewed Vision for Energy Conservation in Ontario*, page 4, July 2013. http://www.energy.gov.on.ca/en/files/2014/09/conservation-first-en.pdf
11. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.
12. Minister of Energy, directive to the Ontario Power Authority, *Re: Amending March 31, 2014 Direction Regarding 2015-2020 Conservation First Framework*, October 23, 2014. http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-2415.pdf
13. Ontario Energy Board, EB-2008-0346 report, *Demand Side Management Guidelines for Natural Gas Utilities*, section 6.2, June 30, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/Regulatory/DSM_Guidelines_for_Natural_Gas_Utilities.pdf Ontario Energy Board, EB-2014-0134 report, *Draft Report of the Board: Demand Side Management Framework for Natural Gas Distributors*, section 8.2, September 15, 2014. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2014-0134/Draft_Report_of_Board_DSM_Framework_20140915.pdf
14. Ontario Energy Board, EB-2008-0346 report, *Staff Discussion Paper: On Revised Draft Demand Side Management Guidelines for Natural Gas Utilities*, section 3.5.2.2, January 21, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2008-0346/BrdStaff_DiscPaperRevDraft_DSM_Guidelines_20110121.pdf Ontario Energy Board, EB-2008-0346 report, *Demand Side Management Guidelines for Natural Gas Utilities*, section 6.2, June 30, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/Regulatory/DSM_Guidelines_for_Natural_Gas_Utilities.pdf
15. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2010 (Volume Two)*, section 3.1, December 2011. http://www.ecoissues.ca/index.php/Progress_on_Selected_Energy_Conservation_Initiatives_2010
16. Ontario Power Authority and Harris/Decima, presentation, *Ontario Power Authority Culture of Energy Conservation Market Research 2013*, page 8, undated. http://powerauthority.on.ca/sites/default/files/Culture%20of%20Energy%20Conservation%202013%20Market%20Research%20Report.pdf

17. Although the Long-Term Energy Plan was released three months before the achievable potential study, the OPA has indicated that the study was used to help develop the Long-Term Energy Plan target. See: http://www.powerauthority.on.ca/news/conservation-achievable-potential-study.

18. The OPA's end-user forecaster model was developed in 2009. At the time of its development, 2004 was the most recent year for which complete Ontario consumption data was available. Therefore, 2005 is the first year for which estimates of technical and economic potential are available from the end-use forecaster model.

19. To pass the economic screen measures had to be positive (i.e., >1) based on the Total Resource Cost test contained in the OPA's end-use forecaster model. Additional measures that failed the screen or were not included in the model were incorporated into the study if the consultant determined that the measure would likely be adopted by the Ontario market during the study period. The study noted that future updates could include a sensitivity analysis by setting a range of Total Resource Cost test cut-off values, and analyzing how changing the Total Resource Cost test screen affected the estimate of technical potential. The Total Resource Cost test performed for this study would not account for the non-energy benefits of conservation, as the study was done before the Minister of Energy's October 23, 2014 direction that cost-benefit analyses should include a 15 per cent adder to recognize the non-energy benefits of conservation, including environmental benefits.

20. Given the long-term nature of the study, some elements of the technical potential assessment are naturally speculative. For example, it is likely that costs of some conservation measures will decrease in the future as technology improves and market share grows, and that new measures will become available. The study models technological progress by assuming in some cases that even higher levels of efficiency will be available in the future at similar costs to today's higher-efficiency products.

21. Sector experts included suppliers and their trade associations, customers, professional engineers, and program administrators.

22. The study did not report results explicitly for the year 2020. Upper conservation potential in 2020 was determined based on the forecast rate of savings growth between 2017 (13.1 TWh) and 2022 (20.7 TWh), and was determined to be 17.6 TWh. This amount was comprised of savings from: Codes and Standards (4.3 TWh); existing 2004-2014 CDM programs with savings that persist into 2015-2020 (3.0 TWh); other influenced conservation (0.3 TWh); CDM from transmission-connected customers (1.4 TWh); and LDC-CDM programs (8.6 TWh). According to the OPA, the Conservation First Framework's 7 TWh target was determined as the "moderate point" between the lower achievable potential (unknown) and the upper achievable (8.6 TWh) amounts.

23. Ontario Power Authority, information provided to the ECO in response to ECO inquiry, October 23, 2014.

24. ICF Marbek, report, *Achievable Potential: Estimated Range of Electricity Savings from Energy Efficiency and Energy Management*, March 26, 2014.

25. Available from the OPA's website: http://www.powerauthority.on.ca/opa-conservation/conservation-first-framework-tool-kit/planning-process-and-tools

26. The next achievable potential study is to be completed by June 1, 2016. See: Minister of Energy, directive to Ontario Power Authority, *Re: 2015-2020 Conservation First Framework,* March 31, 2014 – section 6.2 http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-856.pdf

27. Government of Ontario, report, *Achieving Balance Ontario's Long Term Energy Plan*, December 6, 2013.

28. Government of Ontario, report, *Achieving Balance Ontario's Long Term Energy Plan*, page 4, December 6, 2013.

29. Ontario Power Authority, website, *Long Term Energy Plan 2013 detailed LTEP information breakdown*. Available at: http://www.powerauthority.on.ca/power-planning/long-term-energy-plan-2013

30. The last coal plant in Ontario, the Thunder Bay generating station, ceased to use coal in April 2014.

31. In its response to an ECO inquiry, the Ministry indicated that the Ontario Energy Report will be a quarterly report.

32. Since the Plan's release, the Ministry has held one consultation session in September 2014 to present four

preliminary options to deliver on-bill financing to residential and small business consumers starting in 2015. The options include both mandatory and voluntary delivery of on-bill financing by LDCs and/or natural gas utilities. The Ministry is currently seeking feedback from stakeholders and has not chosen a preferred option.

33. This includes the multi-year shut down of the Darlington and Bruce nuclear generating stations for extensive maintenance and the end of service of Pickering nuclear generating station.

34. These flexible resources are forecast to provide 6 per cent of Ontario's installed capacity in 2025 and less than one per cent of total electricity generation in 2032.

35. The target is an annual savings target that refers to the amount saved in 2032 relative to a baseline year of 2005. The 2020 electricity savings target of 7 TWh for LDC-delivered conservation programs serves as a partial interim target, but does not encompass all of the categories of conservation activities included within the LTEP target.

36. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 2014.

37. Net peak demand in 2025 is forecast to be 24,429 MW.

38. The OPA lists the five types of demand response resources that will be used to reduce forecast peak demand in 2025 by 10 per cent (~2,400 MW). These include: existing demand response programs, new demand response resources to be developed, TOU rates, the industrial conservation initiative, and dispatchable customer loads under contract in the market. The ECO notes that savings from TOU rates (forecast to be 250 MW in 2025) were already accounted for in the gross-to-net calculation of peak demand. Therefore, TOU rates will not be a demand response resource that delivers new savings toward net peak demand reduction.

39. Minister of Energy, direction to the Ontario Power Authority, *Re: Continuance of the OPA's Demand Response Program under IESO management*, March 31, 2014.
http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-853.pdf

40. Minister of Energy, direction to the Ontario Power Authority, *Re: Renewable Energy Program*, June 12, 2013
http://www.powerauthority.on.ca/sites/default/files/MC-2013-1450-DirectionRenewableEnergyProgram.pdf

41. Minister of Energy, direction to the Ontario Power Authority, *Re: Moving Forward with Large Renewable Energy Projects, Renewable Energy Projects in Remote First Nation Communicates and Energy Storage*, December 16, 2013
http://www.powerauthority.on.ca/sites/default/files/news/December-16-2013-Directive-Renewable-Energy.pdf

42. Although the Ministry of Energy has now indicated the Ontario Energy Report will be a quarterly, not annual, report, it is not clear if targets will still be reviewed annually, or quarterly.

43. The Ministry of Energy also presented Ontario's fuel consumption for the 2011 calendar year (the most recent data available at the time) in: Government of Ontario, report, *Making Choices: Reviewing Ontario's Long-Term Energy Plan*. Figure 1 of that report is derived from data contained in CANSIM Table 128-0016, supplemented by Table 127-0004 to present fuel consumption at the end-use level. This interpretation shows electricity consumption accounted for 26 per cent of Ontario's fuel consumption in 2011.

44. Government of Ontario, legislation, Ontario Regulation 424/04 - Integrated Power System Plan, made under the *Electricity Act, 1998*

45. Government of Ontario, legislation, *Electricity Act, 1998* section 25.30(2)(4) and (1).

46. Government of Ontario, report, *Ontario's Long-Term Energy Plan, Building Our Clean Energy Future*, page 64, November 23, 2010.

47. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 2014.

48. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 2014.

49. For example, see: http://canadagazette.gc.ca/rp-pr/p2/2014/2014-01-15/pdf/g2-14802.pdf page 219 for the range of forecast energy savings attributed to switching from an incandescent light bulb to a more efficient light bulb.

50. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress report – 2012 (Volume Two)*, page 16, December 2013.

51. Government of Ontario, report, *Ontario's Long Term Energy Plan, Building Our Clean Energy Future*, page 64, November 23, 2010.

52. The Ontario Power Authority has the ability to extend funding for the 2011-2014 programs through 2015 as a transitional measure, if needed. See: Ontario Ministry of Energy, direction to the Ontario Power Authority, December 21, 2012: http://www.powerauthority.on.ca/sites/default/files/page/Dec21Direction-CDMFramework.pdf

53. Minister of Energy, directive to the Ontario Energy Board, March 26, 2014: http://www.ontarioenergyboard.ca/oeb/_Documents/Documents/Directive_to_the_OEB_20140326_CDM.pdf

54. Minister of Energy, direction to the Ontario Power Authority, *Re: 2015-2020 Conservation First Framework*, March 31, 2014: http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-856.pdf

55. Minister of Energy, direction to the Ontario Power Authority, *Re: Amending March 31, 2014 Direction Regarding 2015-2020 Conservation First Framework*, October 23, 2014: http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-2415.pdf

56. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2011 (Volume Two)* page 42, and – 2010 *(Volume 1)* page 32.

57. Ontario Power Authority, report, *Implementing the Conservation First Framework LDC Engagement Session. Consultation Summary Report from Regional LDC sessions*, June 2014: http://www.powerauthority.on.ca/sites/default/files/conservation/Conservation-First-Framework-Summary-Report-w-Appendix.pdf

58. Behind the meter generation is considered conservation because it makes more efficient use of electricity without transmission/distribution system losses, and encourages consumers with on-site generation to play a more active role in their electricity consumption. OPA guidelines limit eligibility for province-wide behind the meter projects to waste energy recovery projects, and gas/propane-fired CHP that is sized to meet facility thermal load: http://www.powerauthority.on.ca/sites/default/files/conservation/Eligible-BMG-Rules-Draft-v1.pdf

59. If either the solution or customer experience offered by a local program is noticeably and substantively different than what is offered by 2011-2014 province-wide or regional distributor programs, then the program or measure is not considered a duplicate. Definitions of noticeably and substantively for the purpose of determining duplication are outlined in the OPA guiding document: http://www.powerauthority.on.ca/sites/default/files/conservation/Avoiding-Duplication-Guideline-draft-v1.pdf

60. Although the target allocation included a residential and non-residential component, LDCs are only responsible for achieving their total CDM target.

61. In 2012 conservation was delivered at an average cost of 3.9 cents/kWh, see: Ontario Power Authority, report, *2012 Conservation Results*, December 2013.

62. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2012 (Volume Two)*, page 35, December 2013. According to Table 7, cost-effectiveness of business (TRC 1.8, PAC 2.8) and industrial (TRC 4.0, PAC 1.2) conservation programs improved in 2012 while it declined for residential programs (TRC 1.0, PAC 1.3).

63. This amount will be less the amount of any performance incentive received at the mid-term review.

64. The mid-term incentive payment is only eligible on the portion of a distributor's target allocated to the full cost recovery mechanism. Where two or more LDCs have collaborated to achieve savings, the mid-term incentive will be paid if the collaborating LDCs have collectively achieved at least 50 per cent of their aggregated targets. Savings achieved by December 31, 2017 must be expected to persist to at least December 31, 2020 to be considered eligible for the mid-term incentive payment.

65. If the LDC has achieved progress of 50 per cent or less, an administrative "remedy" may be applied until progress is greater than 50 per cent. Additional "remedies" may also be applied if the LDC's program delivery

was not cost-effective. Remedies may include: mentoring from other LDCs or service providers; OPA support; meetings between senior officers of the OPA and the LDC; the development of a performance improvement plan by the LDC; or increased reporting requirements for the LDC. Prospective budget adjustments may be made by OPA if an LDC's Full Cost Recovery progress is between 35 and 50 per cent during the years 2015 through 2017 and program delivery was not cost-effective. Through the years 2018 and 2020, financial remedies may be applied. See the Energy Conservation Agreement for full details.

66. In a presentation to the Conservation First Stakeholder Advisory Committee, the OPA indicated that only three utilities did not have cost-effective portfolios during the 2011-2014 framework. Under the new Framework these LDCs would likely have been eligible for exemption from the cost-effectiveness requirement: http://www.powerauthority.on.ca/sites/default/files/page/Conservation-First-Framework-Update_0.pdf

67. The OPA committed to a 30-day approval period for CDM Plans submitted jointly by two or more distributors. For a CDM Plan submitted by one distributor, the approval period is 60 days. The clock will be stopped if the OPA requires more information. The clock will start again once the OPA considers the LDC to have satisfied its request for further information. http://www.powerauthority.on.ca/sites/default/files/framework/CDM-Plan-Submission-Review-Criteria-Rules-Draft-v1.pdf

68. The obligations of the Energy Conservation Agreement will take effect only once a distributor's CDM Plan is approved

69. Measurement data for conservation technologies contained in the protocols were updated in 2014.

70. It is not clear from the directive if LDCs will submit an annual report to the Board; the OPA will likely submit results for the Board to publish.

71. Ontario Power Authority, information provided to the ECO in response to ECO inquiry, September 12, 2014

72. The OPA assumed the following costs per unit of conservation: 2015-2020: 3.5 - 4 cents per kilowatt-hour (¢/kWh); 2021-2025: 4 - 4.5 ¢/kWh; and 2026-2032: 4.5 ¢/kWh.
See: http://powerauthority.on.ca/sites/default/files/planning/LTEP-2013-Module-4-Cost.pdf - slide 13

73. For example, behavioural conservation measures such as 'temperature setback', 'only necessary outdoor lighting', and 'increase temperature of air conditioning' ranked within the top 20 most cost-effective residential measures in the Achievable Potential Study. See: ICF Marbek, report, *Achievable Potential, Estimated Range of Electricity Savings Through Future Ontario Conservation Programs – Residential Sector*, March 26, 2014, exhibit 59.

74. It is questionable what impact this will have. Even with the stricter accountability measure of making target achievement a condition of LDC licence, many LDCs expect to fall short of at least their peak demand reduction 2011-2014 Framework target. Ultimately, these LDCs will be in violation of their licence conditions, but at this time it is still unclear how the Board intends to respond.

75. Ontario Energy Board, document, *Filing Requirements for Electricity Distribution Rate Applications*, chapter 5, pages 19 – 25, July 17, 2013.
In terms of government guidance on LDC-level planning, Section 5 of the March 2014 Directive to the OEB on the Conservation First framework gave the Board no specific direction on steps it should take to put conservation first in distributor infrastructure planning. The directive adds a caveat which could be used to rank conservation lower in priority than generation or transmission. Conservation need only be prioritized where cost-effective and where it does not diminish system reliability. Conservation is nearly always the least-cost option but it can be argued that generation, though often the most expensive solution is more reliable. This is an element of planning left unresolved with only a vague assurance that "the ministry will [...] work with the Ontario Energy Board (OEB) to put conservation first in distributor planning processes for both electricity and natural gas utilities (LTEP, p. 27)." Clarity is needed on the OEB's mandate to facilitate conservation since LDC conservation targets are no longer a licence condition and the Board has no authority for a CDM Code.

76. Minister of Energy, letter to the Ontario Power Authority and the Independent Electricity System Operator, May 6, 2013.

77. Ministry of Energy, news release, *New Ontario Government Strengthens Energy Planning*, May 6, 2013.

78. Ministry of Energy, news release, *Ontario Improving Decision-Making on Large Energy Projects: Government Implementing Changes to Regional Planning and Siting*, October 8, 2013.

79. Ministry of Energy, news release, *Regional Planning*, December 2, 2013.

80. Government of Ontario, news release, *Ontario Working With Communities to Secure Clean Energy Future*, May 30, 2013.

81. Ontario Power Authority, document, *Large Renewable Procurement – Request for Proposals (LRP I RFP) Framework*, (undated), page 4.

82. Ministry of Energy, news release, *Statement from Ontario Minister of Energy*, August 7, 2013; Ministry of Energy, news release, *OPA-IESO Planning and Siting Recommendations*, October 8, 2013; Ministry of Energy, news release, *Regional Planning*, December 2, 2013; Ministry of Energy, news release, *Ontario Improving Decision-Making on Large Energy Projects*, October 8, 2013.

83. Ontario Energy Board File numbers: EB-2010-0377, EB-2010-0378, EB-2010-0379, EB-2011-0043 and EB-2011-0004.

84. Planning Process Working Group Report to the Board (prepared for the Ontario Energy Board), report, *The Process for Regional Infrastructure Planning in Ontario*, May 17, 2013.

85. From the first completed scoping study completed under the new IRRP process (GTA West Southern Sub-Region), a third outcome also appears possible where the OPA determines that no regional planning is needed after all, and returns responsibility to the transmitter, without the need for a RIP/IRRP.

86. Public engagement in development of RIPs occurs at two points: the scoping stage and the project level. Similar opportunities to comment exist in the IRRP process. The OPA briefly posts (for two weeks) a draft scoping process report for comment, and feedback is considered before finalizing the Scoping Assessment Outcome Report. This is a key decision point on whether conservation (or generation) will be considered as alternatives to "wires" investments. If these alternatives are eliminated at this stage, they likely won't be re-examined later in the process. The other point of engagement occurs when transmission projects contained in an RIP undergo an Environmental Assessment or an OEB hearing on the specific project details.
Enhancements were made by the OEB to increase the transparency of information materials in the RIP process. The transmitter will attach the scoping process report to its Regional Infrastructure Plan and provide public notification of this. The transmitter also provides regular status reports of the RIP process to enhance accountability.

87. The OPA uses the term *integrated resource solution* to mean that a mixture of conservation and/or generation and/or transmission can be used to meet the regional need. Conservation can involve using less power or shifting the timing of use or installing small-scale distributed generation behind the meter that mean fewer large centralized generating stations need to be built.

88. The OPA-IESO report made several recommendations on increasing public engagement in planning and siting but their formal adoption in practice is not yet complete, as the first regional plans are under development and the process continues to evolve. A likely key node for public engagement will be the opportunity for public review and comment on the draft IRRP (there is no equivalency of comment on a draft RIP).

89. The report responded to these interpreted objectives, except for inclusion of the standing committee's advice as it has not yet reported. The Minister's letter of direction requested that the regional planning report reflect recommendations of the Legislature's justice policy committee. As the Standing Committee on Justice Policy was examining the cancellation of the two natural gas-fired plants, and had not tabled its findings when the OPA and IESO issued their report, the agencies simply noted and repeated opportunities to engage local communities on siting that exist in the current planning process but offered no enhancements.

90. Ontario Power Authority and Independent Electricity System Operator, report, *Engaging Local Communities in Ontario's Electricity Planning Continuum*, page 4, August 1, 2013.

91. Successful municipalities from the first round of program applications include: Municipality of Chatham-Kent, City of Kingston, Town of Markham, Town of Newmarket, City of Temiskaming Shores, City of Vaughan, Municipality of Wawa and City of Woodstock. The government is still accepting applications on an ongoing basis for two streams: (1) funding stream to develop a new municipal energy plan; successful applicants will receive 50 per cent of eligible costs, up to a maximum of $90,000; (2) new funding stream to enhance an existing energy plan; successful applicants will receive 50 per cent of eligible costs, up to a maximum of $25,000. MEPs will help municipalities assess their community's energy use and greenhouse gas (GHG) emissions; identify opportunities to conserve, improve energy efficiency and reduce GHG emissions; consider the impact of future growth, and options for local clean energy generation; and support local economic development.

92. Quality Urban Energy Systems of Tomorrow, report, *Advancing Integrated Community Energy Planning in Ontario: A Primer*, September 2013.

93. When a generating station or a transmission line is the proposed solution, the term *siting* refers to the geographic location (physical plot of land or right-of-way corridor) where the infrastructure will be put. This can occur through the IRRP or RIP processes or as a result of a ministerial directive.

94. Ministry of Energy, news release, *New Ontario Government Strengthens Energy Planning*, May 6, 2013.

95. The *Green Energy Act* exempts renewable projects from local zoning rules.

96. There may in fact be disconnects between regional plans and the provincial plan that should be explained, for example, conservation to reduce peak demand. Developing a demand forecast is a key step in the IRRP process and the LTEP proposes to use demand response (load shifting) programs to meet 10 per cent of peak demand by 2025. The OEB report, *The Process for Regional Infrastructure Planning in Ontario*, Appendix 9, points out that regional peaks are not necessarily coincident with province-wide peak, nor are the two forecasts necessarily aligned in the medium and long term.

97. Ministry of Energy, information provided to the ECO in response to ECO inquiry, August 19, 2014.
Ontario Power Authority, information provided to the ECO in response to ECO inquiry, August 19, 2014.

98. Industrial demand response time-of-use rates are not included in LDC CDM targets and some argue that LDCs have little incentive to deliver the *peaksaver* program since it does not count to their targets.

99. In Ontario Energy Board hearing EB-2013-0192 to amend the OPA's licence to incorporate its regional planning obligations, intervenors argued that the options included in the definition of IRRP should include storage in addition to generation, transmission and distribution. The OEB agreed that storage investments should be included but preferred more generic terminology and so used the term "other electricity system initiatives" in the definition of an IRRP included in the OPA licence.

100. Ontario Power Authority and Independent Electricity System Operator, report, *Engaging Local Communities in Ontario's Electricity Planning Continuum*, page 33, August 1, 2013.

101. Environmental Commissioner of Ontario, report, *Managing New Challenge, Annual Report 2013-14*, pages 132 – 139, October 2014; Environmental Commissioner of Ontario, report, *Getting to K(No)w, Annual Report 2007-2008*, pages 28-48, October 2009.

102. Shale gas from the U.S. produced through hydraulic fracturing is currently less expensive than the traditional sources of natural gas supply from Western Canada, if transportation costs are included. Because natural gas distributors resell gas at the price they pay for it and simply pass this cost through to the customer (earning revenues only on its delivery), any savings in the form of lower natural gas commodity costs would be passed on to natural gas customers.
At the OEB hearing, the Council of Canadians argued that Ontario should not support investments that facilitate hydraulic fracturing for natural gas (albeit in other jurisdictions). The Board dismissed this argument, noting that there are no Ontario or Canadian regulations that prohibit shale gas production or transportation, and thus no basis by which the Board could reasonably deny the application on these grounds. The ECO has written several times about the environmental concerns associated with potential hydraulic fracturing in Ontario, most recently in: Environmental Commissioner of Ontario, report, *Serving the Public, Annual Report 2012/13*, section 4.7, September 2013. http://www.ecoissues.ca/index.php/Shale_Gas_Regulate_Before_Fracking_Begins

103. Enbridge Gas Distribution, EB-2012-0451 Application and Evidence, Exhibit A, Tab 3, Schedule 1, April 15, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/378356/view/Enbridge_APPL_GTA%20Project_Exhibit%20A_20130722.PDF

104. Enbridge Gas Distribution, EB-2012-0451 Application and Evidence, Exhibit A, Tab 3, Schedule 1, page 12, April 15, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/378356/view/Enbridge_APPL_GTA%20Project_Exhibit%20A_20130722.PDF

105. The Technical Standards & Safety Authority has recommended that pipeline operating pressure should be below 30% of the specified minimum yield strength of the pipe in populated areas. Above this pressure, pipelines damaged by excavation are more likely to fail as ruptures, instead of as small point source leaks.

106. Green Energy Coalition, EB-2012-0451, EB-2012-0433, EB-2013-0074 Submission, *Green Energy Coalition (GEC) Final Argument*, November 15, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/416871/view/GEC_Subs_GTA_Pipelines20131115.PDF
Environmental Defence, EB-2012-0451, EB-2012-0433, EB-2013-0074 Submission, *Submissions and Compendium of Environmental Defence*, November 14, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/416853/view/ED_SubmissionsAndCompendium_131114.PDF

107. Enbridge Gas Distribution, EB-2012-0451 Application and Evidence, Exhibit A, Tab 3, Schedule 7, April 15, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/416853/view/ED_SubmissionsAndCompendium_131114.PDF

108. Ontario Energy Board, EB-2012-0451, EB-2012-0433, EB-2013-0074 Decision and Order, January 30, 2014. A portion of the Union Gas proposal (the Brantford-Kirkwall pipeline) is conditional on approval of TransCanada's King's North project by the National Energy Board.
http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/424174/view/dec_order_Enbridge_Union_GTA-Parkway_20140130.PDF

109. Ontario Energy Board, EB-2012-0451, EB-2012-0433, EB-2013-0074 Decision and Order, page 45, January 30, 2014. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/424174/view/dec_order_Enbridge_Union_GTA-Parkway_20140130.PDF

110. Ontario Energy Board, EB-2012-0451, EB-2012-0433, EB-2013-0074 Decision and Order, page 46, January 30, 2014. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/424174/view/dec_order_Enbridge_Union_GTA-Parkway_20140130.PDF

111. Issues that the Board specifically mentioned could be examined in a review of integrated resource planning were the potential for targeted demand-side management, the role of alternative rate designs and interruptible loads, risk assessment, and shareholder incentives.

112. Ontario Energy Board, E.B.O.169-III Report of the Board, *A Report on the Demand-Side Management Aspects of Gas Integrated Resource Planning*, July 23, 1993.

113. Ontario Energy Board, EB-2012-0451, EB-2012-0433, EB-2013-0074 Decision and Order, page 46, January 30, 2014. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/424174/view/dec_order_Enbridge_Union_GTA-Parkway_20140130.PDF

114. Enbridge Gas Distribution, EB-2012-0451, EB-2012-0433, EB-2013-0074 Reply Argument, *Reply Argument of Enbridge Gas Distribution Inc.*, page 33, November 25, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/418261/view/EGDI_ReplyARG_20131125.PDF

115. Having a legal framework in place does not guarantee that integrated resource planning truly takes place in practice. For example, Fortis BC's 2014 long-term resource plan application claims that while conservation measures reduce total natural gas use, their impact on peak gas demand cannot be accurately predicted. This argument is almost identical to that used by Enbridge in the GTA pipeline application. Fortis' plan thus rules out conservation/demand management as an alternative to supply infrastructure investments and claims that this meets BC's legislative planning requirement.

116. Minister of Energy, directive to the Ontario Energy Board, March 26, 2014. http://www.ontarioenergyboard.ca/oeb/_Documents/Documents/Directive_to_the_OEB_20140326_CDM.pdf

117. Ontario Energy Board, EB-2014-0134 Report, *Draft Report of the Board: Demand Side Management Framework for Natural Gas Distributors*, September 15, 2014. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2014-0134/Draft_Report_of_Board_DSM_Framework_20140915.pdf

118. Ontario Energy Board, EB-2014-0134 Report, *Draft Report of the Board: Demand Side Management Framework for Natural Gas Distributors*, page 5, September 15, 2014. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2014-0134/Draft_Report_of_Board_DSM_Framework_20140915.pdf
The "load factor" is the ratio of the average demand on a system to the peak demand, and measures how fully the system is utilized (a ratio of 1 being the maximum). As noted, this ratio is about 1/3 on Enbridge's current system in the GTA. Infrastructure costs are driven largely by peak demand, so a higher load factor reduces the fixed infrastructure costs per unit of natural gas delivered, in much the same way that airlines and hotels are most profitable when they operate close to maximum capacity.

119. Ontario Energy Board, EB-2014-0134 Report, *Draft Report of the Board: Demand Side Management Framework for Natural Gas Distributors*, page 9, September 15, 2014. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2014-0134/Draft_Report_of_Board_DSM_Framework_20140915.pdf

120. The cross-examination of Enbridge staff by Environmental Defence counsel Kent Elson at the OEB hearing is particularly instructive in revealing some of the issues with Enbridge's forecasting methodology, as is the final submission of Environmental Defence.
Ontario Energy Board, EB-2012-0451, EB-2012-0433, EB-2013-0074 Hearing Transcripts, Volume 5, pages 4-24, September 24, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/410753/view/
Environmental Defence, EB-2012-0451, EB-2012-0433, EB-2013-0074 Submission, *Submissions and Compendium of Environmental Defence*, pages 8-16, November 14, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/416853/view/ED_SubmissionsAndCompendium_131114.PDF

121. School Energy Coalition, EB-2012-0451, EB-2012-0433, EB-2013-0074 Submission, *Final Argument of the School Energy Coalition*, page 7, November 15, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/416928/view/SEC_EGDUnionLTC_FinalArg_20131115.PDF

122. Jay Shepherd Professional Corporation, Letter, *Re: EB-2014-0116 – Gas DSM Framework – Working Group*, July 30, 2014. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/444927/view/SEC_Comments_DSM_Working%20Group_20140730.PDF

123. In fact, the draft framework proposes reducing the incentives available to utilities for demand-side programs. Ontario Energy Board, EB-2014-0134 Report, *Draft Report of the Board: Demand Side Management Framework for Natural Gas Distributors*, section 6, September 15, 2014. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2014-0134/Draft_Report_of_Board_DSM_Framework_20140915.pdf

124. Ontario Power Authority, report, *OPA Prescriptive Measures and Assumptions List*, page 5, January 2014. http://www.powerauthority.on.ca/sites/default/files/OPA-Prescriptive-Measures-Assumptions-2014.pdf

125. This is not the case in the electricity sector. Peak shifting often means that some fossil-fuelled electricity generation can be replaced with lower-carbon generators (e.g. nuclear, hydro, other renewables), reducing the sector's greenhouse gas emissions.

126. The system is also designed to supply a certain amount of reserve energy to cover any sudden or unexpected loss of power supply.

127. Note: the electricity commodity price reflects only one part of an electricity bill; there are other factors, like distribution charges, and the Debt-Retirement charge, that also affect a consumer's bill.

128. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2010 (Volume One)*, page 24, June 2011.

129. There is an exception for non-RPP small volume customers with retail contracts. These customers see the Global Adjustment as a line item on their bill.

130. Remaining customers are on a tiered pricing system.

131. Ahmad Faruqui, Phil Hanser, Ryan Hledik, Jenny Palmer, The Brattle Group, white paper, *Assessing Ontario's Regulated Price Plan*, December 8, 2010. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2010-0364/Report-Assessing%20Ontarios%20Regulated%20Price%20Plan.pdf

132. Ahmad Faruqui, Phil Hanser, Ryan Hledik, Jenny Palmer, The Brattle Group, white paper, *Assessing Ontario's Regulated Price Plan*, December 8, 2010. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2010-0364/Report-Assessing%20Ontarios%20Regulated%20Price%20Plan.pdf

133. Staff Report to the Board, Ontario Energy Board, report, *Review of the Structure and Price Settling Methodology for Time-of-Use Prices*, page 4, March 25, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2010-0364/TOU_Consultation_Staff_Report_20110331.pdf

134. Staff Report to the Board, Ontario Energy Board, report, *Review of the Structure and Price Settling Methodology for Time-of-Use Prices*, page 8, March 25, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2010-0364/TOU_Consultation_Staff_Report_20110331.pdf

135. Staff Report to the Board, Ontario Energy Board, report, *Review of the Structure and Price Settling Methodology for Time-of-Use Prices*, page 8, March 25, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/EB-2010-0364/TOU_Consultation_Staff_Report_20110331.pdf

136. Price responsiveness refers to an elasticity analysis. An elasticity captures the relationship between a good's price and the amount of demand for that good, or the relationship between a good's price and the demand for another good. In this study, two types of elasticities were estimated: 1) the change in the ratio of peak-to-off-peak use by a 1 per cent change in the price ratio; 2) the change in average monthly consumption due to a 1 per cent change in the average monthly price.
Economic effects include the elasticity of substitution between pricing periods and the overall price elasticity of demand.

137. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.

138. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.

139. ChallengePost, Inc., Delivered by MaRS and Sponsored by the Ontario Government, website, *Energy Apps for Ontario Challenge – Powered by Smart Grid*, accessed November 12, 2014. http://energyappsontario.challengepost.com/

140. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.

141. Class A customers have the opportunity to opt-out if they wish.

142. Independent Electricity System Operator, presentation, *Allocation of Global Adjustment*, slide 6, March 31, 2010. http://www.ieso.ca/Documents/consult/sac/sac-20100331-Allocation-of-Global-Adjustment.pdf

143. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2010 (Volume One)*, page 27, June 2011. http://www.eco.on.ca/index.php/en_US/pubs/energy-conservation-reports/cdm10v1-managing-a-complex-energy-system

144. Ministry of Energy, information provided to the ECO in response to ECO inquiry, October 23, 2014.

145. The new Napanee Generating Station is 900 MW and will be located next to the Lennox Generating Station. It is expected to be in service by 2018.

146. Class A consumers are charged a Global Adjustment based on their percentage of contribution to the top five hours of peak demand over the base period. At the end of each base period, the sum of a consumer's coincident peak is divided by the sum of the province's system peaks to determine the consumer's peak demand factor

(PDF). This factor is used to determine the consumer's Global Adjustment charge by multiplying the province's total Global Adjustment cost for the month by the consumer's PDF for the associated adjustment period. Successful load reductions for the High-5 hours in one base period will lower a consumer's PDF in the following base period. This has an overall positive impact for a Class A consumer's bill.

147. These figures do not include potential participants who are now eligible due to the eligibility threshold being lowered to 3 MW from 5 MW.
Ontario Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.

148. Ontario Power Authority, information provided to the ECO in response to ECO inquiry, November 7, 2014.

149. The estimate of a $500 million transfer of costs between Class A and Class B customers is based on comparing the actual Global Adjustment costs paid by Class A customers (http://www.ieso.ca/Pages/Ontario's-Power-System/Electricity-Pricing-in-Ontario/Global-Adjustment.aspx) with the amount that they would have paid if the Global Adjustment was determined based on volumetric consumption, assuming that Class A customers represent 17 per cent of total consumption.

150. Navigant Consulting Ltd. (prepared for the Independent Electricity System Operator), report, Global Adjustment Review, January 23, 2014.
http://www.ieso.ca/documents/consult/se106/se106-20140128-Global_Adjustment_Review_Report.pdf

151. O. Reg. 126/14 amended O. Reg. 429/04, and was filed on May 1, 2014.
The change to ICI expands Class A eligibility for customers who own or operate a load facility classified under the North American Industry Classification System as one of the following: 21 (mining, quarrying, and oil and gas extraction); 31 to 33 (manufacturing); 1114 (greenhouse, nursery, and floriculture production); 493120 (refrigerated warehousing and storage); 518 (data processing, hosting and related series)

152. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.

153. Ministry of Energy, information provided to the ECO in response to ECO inquiry, September 18, 2014.

154. Ministry of Energy, information provided to the ECO in response to ECO inquiry, October 23, 2014.

155. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2010 (Volume One)*, page 27, June 2011 http://www.eco.on.ca/index.php/en_US/pubs/energy-conservation-reports/cdm10v1-managing-a-complex-energy-system.

156. Independent Electricity System Operator, information provided to the ECO in response to ECO inquiry, November 6, 2014.
Ontario Power Authority, information provided to the ECO in response to ECO inquiry, November 7, 2014.

157. Independent Electricity System Operator, information provided to the ECO in response to ECO inquiry, November 6, 2014.

158. For example, assume a customer with a total electricity demand of 300 MW has 100 MW of consumption enrolled in the Demand Response 3 (DR3) program, and has a historical pattern of reducing consumption by 250 MW during the High-5 hours. If a DR3 activation corresponded with a High-5 hour, the customer could obviously not reduce its consumption by 350 MW, as this exceeds its total consumption.

159. Independent Electricity System Operator, information provided to the ECO in response to ECO inquiry, November 6, 2014

160. Indirectly, by reducing the percentage of Global Adjustment costs that are based on consumption during the "High 5" hours.

161. Some targets include a deadline for conclusion of the conservation activities and some specify energy savings from a particular sector or class of customers. Although not stated, the ECO assumes, unless otherwise indicated, that the quantity of energy specified represents net savings (i.e., adjusted for free riders and other factors).

162. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2011 (Volume Two)*, page 15, December 2012.

163. **The data is not weather normalized and so cannot be compared year-over-year. Data is collected from 8,131 electricity meters and 5,711 natural gas meters.**

164. **Provincial energy intensity values previously reported by the ECO differ from values reported this year. The Ministry of Education indicated that the UCD is a live database and any changes, such as the addition of new sites or meters, will impact the data and calculations of energy intensity.**

165. **GHG Reductions from Baseline Year**

		Vehicle Fuel Consumption (Litres and kilo tonnes CO_{2eq} [GHG])	Air Travel (air trip miles and GHG)	Emissions in Facilities* (provided by MEDEI) [CO_{2e} (GHG)]
Baseline Energy Amount (2006)		41,365,508 litres 98.3 (KT) CO_2	29,197,253 3.67 (KT) CO_2	2006 Baseline **175.991 (KT) CO_{2e}
Annual Energy Consumption for 1st Year ('09/'10)		37,638,885 litres 89.4 (KT) CO_2	23,732,087 2.98 (KT) CO_2	2009 Calendar Year
Annual Energy Consumption for 2nd Year ('10/'11)		37,897,815 litres 90.1 (KT) CO_2	24,579,468 3.08 (KT) CO_2	2010 Calendar Year
Annual Energy Consumption for 3rd Year ('11/'12)		36,858,804 litres 87.6 (KT) CO_2	23,377,226 2.94 (KT) CO_2	2011 Calendar Year
Annual Energy Consumption for 4th Year ('12/'13)		34,656,113 litres 82.3 (KT) CO_2	21,722,619 2.74 (KT) CO_2	2012 Calendar Year ***132.957 (KT) CO_{2e}
Annual Energy Consumption for 5th Year ('13/'14)		33,867,331 litres 80.5 (KT) CO_2	23,782,638 3.00 (KT) CO_2	2013 Calendar Year ****122.944 (KT) CO_{2e}
% Reduction	'09/'10	- 9.0% (L from baseline) - 9.05% (CO_2 from baseline)	-18.8% (CO_2 from baseline)	2009 CY
	'10/'11	- 8.38% (L from baseline) - 8.34% (CO_2 from baseline)	-16.1% (CO_2 from baseline)	2010 CY
	'11/'12	- 10.89% (L from baseline) - 10.89% (CO_2 from baseline)	-19.9% (CO_2 from baseline)	2011 CY
	'12/'13	-16.22% (L from baseline) -16.22% (CO2 from baseline)	-25.6% (CO_2 from baseline)	2012 CY - 24.5% CO_2 from baseline
	'13/'14	-18.1% (L from baseline) -18.1% (CO_2 from baseline)	-18.2% (CO_2 from baseline)	2013 CY -30.1% CO_2 from baseline

TABLE NOTES

*Energy in Facilities data is presented in calendar not fiscal years and includes consumption from all fuel types (e.g. electricity, natural gas, steam, fuel oil, etc.)

** Baseline will change as a result of changing real estate portfolio. For guidance, the WRI standard for corporate reporting is used as guidance in making baseline adjustments.

***Previous reporting year (in this case 2012) values are a true-up from the last reporting cycle where they were estimated. Values are estimated due to lag in emission factor updates.

****Current reporting year (in this case 2013) is based on estimate emission factor data supplied by the Ministry of Energy. Data will be trued-up in the next annual report.

Additional Notes – Emissions in Facilities:

Data has been removed from 2009-2011 to align with annual energy reporting. As the baseline changes, each dataset from 2009-2011 would also need to be updated creating a significant amount of additional work. The current reporting structure captures progress towards target, true-up from previous year and estimated current reporting year. There is little value in updating past years' data.

Energy (GWh) data was emitted as MEDEI does not report on energy for custodial ministries. All energy data is available through ministry specific annual energy reports.

Emissions factors are adjusted annually as per Natural Resources Canada publications. 2013 Emission Factor is based on Ministry of Energy estimates.

Figures include both Infrastructure Ontario managed facilities, Alternative Financing Procurement facilities, and custodial ministry managed facilities (include MCSCS, MCYS, MTO, MNR and EDU).

Consumption differences from year to year result from:

- IO's conservation efforts for energy target
- Operational and program use changes
- Alternative Financing Procurement net new consumption. The added facilities (from 2009-current) have strict energy efficiency guidelines. However, all have been built after the 2006 baseline. The consumption has only added to total inventory consumption.

166. In September 2014, the OPS Green Office advised the ECO that the date for completion of the target of "a 19% reduction in greenhouse gases below a 2006 baseline by 2014" was the end of fiscal year 2014/2015, not the fiscal year 2013/2014. Previous ECO reports had defined the completion date as March 31, 2014 and the period as April 1, 2009 to March 31, 2014 (this previous information was based on earlier discussions with the OPS Green Office).

167. This amounts to 98.24 GWh of reported savings between 2002/2003 and 2012.

168. Previous 2010 LTEP targets were:
2015 target: 4,550 MW of peak demand savings and 13 TWh of energy savings (baseline year 2005).
2020 target: Additional 1,290 MW of peak demand savings and 8 TWh of energy savings (annual targets of 5,840 MW and 21 TWh).
2025 target: Additional 860 MW of peak demand savings and 4 TWh of energy savings (annual targets of 6,700 MW and 25 TWh).
2030 target: Additional 400 MW peak demand savings and 3 TWh of energy savings (annual targets of 7,100 MW and 28 TWh).

169. Assumes existing demand response remains under contract through 2014. See section 3.3 for more details.

170. Ministry of Transportation, information provided to the ECO in response to ECO inquiry, August 19, 2014.

171. For more details on the *Demand Side Management Guidelines for Natural Gas Utilities* and how this policy framework influenced the types of conservation programs offered by utilities, see:
Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2012 (Volume Two)*, section 2.2, December 2013.
http://www.eco.on.ca/uploads/Reports-Energy-Conservation/2013v2/Building_Momentum_V2.pdf

172. Full details on the performance of natural gas conservation programs in 2013 can be found in Enbridge and Union's demand-side management annual reports:
Enbridge Gas Distribution, report, *2013 DSM Annual Report*, August 26, 2014.

Union Gas, report, *Final Demand Side Management 2013 Annual Report*, November 4, 2014.

173. The types of targets and the formulae for setting these targets are set out in the utilities' three-year plans. The numerical targets are often adjusted from year to year based in part on the previous year's results.

174. The three categories of programs are: (1)resource acquisition programs (focused on delivering direct, measurable energy savings through energy-efficient equipment); (2) programs for low-income customers, usually also focused on direct energy savings; and, (3) market transformation programs (designed to facilitate fundamental changes that will lead to greater market shares of energy-efficient products and services over the longer term). Union's programs for large-volume customers are also resource acquisition programs, but have separate targets. These program categories are defined in: Ontario Energy Board, EB-2008-0346 report, *Demand Side Management Guidelines for Natural Gas Utilities*, June 30, 2011. http://www.ontarioenergyboard.ca/oeb/_Documents/Regulatory/DSM_Guidelines_for_Natural_Gas_Utilities.pdf

175. A proxy for the importance of each target is the maximum incentive that utilities can achieve by reaching the target. This maximum incentive is proportional to the budget for that category of programs, multiplied by the target weight.

176. "Lifetime natural gas savings" is defined as the amount of natural gas that will be saved from all energy-efficient products installed in 2013 through utility resource acquisition programs, over the lifetime of these products.

177. The ECO reported on these results in: Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2011 (Volume Two): Restoring Balance – Results*, section 2.2, December 2012. http://www.eco.on.ca/uploads/Reports-Energy-Conservation/2012v2/12CDMv2.pdf

178. Ontario Energy Board, EB-2013-0109 Decision and Order, page 39, March 27, 2014. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/431205/view/dec_order_Union_ESM_20140327.PDF

179. Ontario Energy Board, EB-2013-0352 Decision and Order, page 7, May 1, 2014. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/436566/view/dec_order_Enbridge%20DSMVA_20140501.PDF

180. Optimal Energy, report, *Independent Audit of Enbridge Gas Distribution 2013 DSM Program Results Final Report*, June 24, 2014.

181. For more information on the role of Local Improvement Charges as a financing tool for energy efficiency projects, see:
Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2012 (Volume One): Building Momentum*, section 5, September 2013.
http://www.eco.on.ca/uploads/Reports-Energy-Conservation/2013v1/13CDMv1.pdf

182. In comparison, over the 2011-2013 period, electricity conservation programs delivered approximately $1.20 in savings per dollar spent.

183. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2011 (Volume Two)*, section 3.2, December 2012.
http://www.eco.on.ca/uploads/Reports-Energy-Conservation/2012v2/12CDMv2.pdf
Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress Report – 2012 (Volume Two)*, section 3.2, December 2013.
http://www.eco.on.ca/uploads/Reports-Energy-Conservation/2013v2/Building_Momentum_V2.pdf

184. The amount of funding recovered through the Global Adjustment in 2013 for conservation initiatives was $335,163,249.86. This does not exactly match the amount of spending reported for province-wide conservation programs and OPA-only programs. The difference is largely a timing issue – conservation administration funds are recovered from the Global Adjustment when they are advanced to LDCs, but are not reported in the spending totals until the LDC has spent these funds on conservation activities.

185. The formula used to calculate cumulative 2011-2014 results gives extra weight to results in early years (2011 projects count for four years of energy savings, 2012 projects count for three years, 2013 projects count for two

years, and 2014 projects count for one), thus LDCs would need to have achieved 90 per cent of their energy target at the end of 2012 to be on pace to achieve the final target.

186. Minister of Energy, direction to the Ontario Power Authority, *Re: Continuance of the OPA'S Demand Response Program Under IESO Management*, March 31, 2014. http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-853.pdf

187. PowerStream Inc., report, *Conservation and Demand Management 2013 Annual Report*, September 30, 2013. http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/451068/view/PowerStream%202013%20Annual%20CDM%20Report%20to%20OEB_20140930.PDF

188. In August 2013, the Minister of Energy directed the OPA to expand eligibility for the Industrial Accelerator Program to include the few commercial and institutional customers who are transmission-connected, as previously these customers were ineligible for any conservation programs. These customer incentives will be for such measures as building retrofits and new building construction.
Minister of Energy, direction to the Ontario Power Authority, *Re: Administrative Matters Related to Renewable Energy and Conservation Programs*, August 16, 2013. http://www.powerauthority.on.ca/sites/default/files/page/DirectionAdministrativeMatters-renewables-Aug16-2013.pdf

189. Minister of Energy, direction to the Ontario Power Authority, *Re: Industrial Accelerator Program*, July 25, 2014. http://www.powerauthority.on.ca/sites/default/files/news/Jul-25-14-Industrial-Accelerator-Program.pdf

190. Savings from customers who enrolled in the peaksaver initiative prior to 2011 that have not converted to the *peaksaver* PLUS initiative offered by LDCs are counted in this category.

191. Statistics Canada, table, *Table 128-0016 - Supply and Demand of primary and secondary energy in terajoules*, available from the CANSIM database: http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1280016&pattern=&csid=

192. Methodological changes were made to improve data quality for the Annual Industrial Consumption of Energy Survey, including adding a new survey in 2009 - the annual Survey of Secondary Distributors of Refined Petroleum - to provide data to the RESD and track consumption of diesel, light fuel oil, heavy fuel oil and motor gasoline.

193. Environmental Commissioner of Ontario, report, *Annual Energy Conservation Progress report – 2012 (Volume 2)*, Appendix A

194. Statistics Canada, report, *Catalogue no. 57-003-X Report on Energy Supply and Demand in Canada – 2011 Revised*, January 27, 2014.

195. "Other" fuels include coal and coal by-products, steam, and refined petroleum products not used in transportation fuels. See CANSIM table 128-0016 for further details of non-transportation refined petroleum products.

196. National Energy Board, report, *Canada's Energy Future 2013 Energy Supply and Demand Projections to 2035*, November 2013: 31. https://www.neb-one.gc.ca/nrg/ntgrtd/ftr/2013/2013nrgftr-eng.pdf

197. National Energy Board and Competition Bureau, report, *Propane Market Review*, April 25, 2014. http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/files/pdf/propane/PropaneFinalReport-eng.pdf

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